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ABSTRACT

This 541-page report includes detailed information on the major science and mathematics curriculum projects from around the world that are now in developmental or active dissemination stages. The report on each project includes both a key for easy access to projects that may fit a user's needs and an extended narrative which details specific information on project objectives and unique characteristics, teacher training, materials availability and costs, evaluation, research and publicity references. In addition, this volume includes a 20-year cumulative directory to all projects that have appeared in "Reports of the International Clearinghouse" from 1956-1976. (Author/CP)

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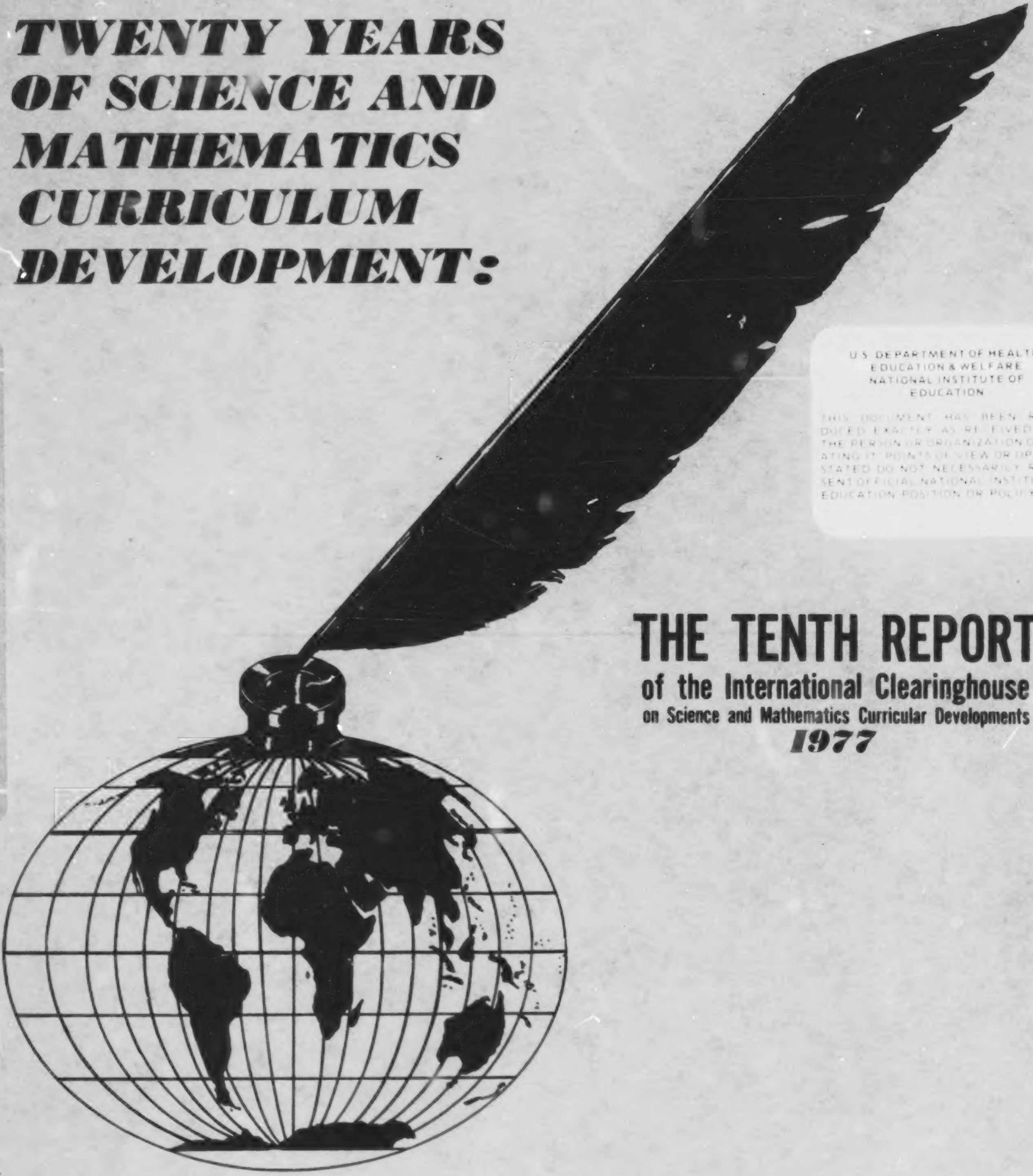
TWENTY YEARS OF SCIENCE AND MATHEMATICS CURRICULUM DEVELOPMENT:



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THE TENTH REPORT

of the International Clearinghouse
on Science and Mathematics Curricular Developments
1977

Edited under the direction of J. David Lockard

THE INTERNATIONAL CLEARINGHOUSE
SCIENCE TEACHING CENTER
UNIVERSITY OF MARYLAND
COLLEGE PARK
U.S.A.

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TWENTY YEARS OF
SCIENCE AND MATHEMATICS
CURRICULUM DEVELOPMENT

Edited Under the Direction of

J. David Lockard

In Collaboration With

Charlene Pritzker and Susan Snyder

A Project of

The International Clearinghouse
Science Teaching Center
University of Maryland
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U.S.A.

PREFACE TO

TWENTY YEARS OF SCIENCE AND MATHEMATICS CURRICULUM DEVELOPMENT:

The Tenth Report of The International Clearinghouse

Introduction

This is the tenth in a series of Clearinghouse Reports that began with the release of the first one in 1963. The Clearinghouse operation started the previous year on the University of Maryland campus under a grant from the National Science Foundation to the American Association for the Advancement of Science (AAAS), whose Commission on Science Education initiated and originally sponsored this activity. The purpose at that time was to summarize the on-going activities in science and mathematics curricular developments throughout the United States. Numerous requests for copies of the annual reports were received from other countries and in 1965 the Clearinghouse went international under the encouragement of the Division of Science Teaching of the United Nations' Educational Scientific and Cultural Organization (UNESCO) in Paris.

Reports, then, were published in 1963, 1964, and 1965 on American projects and in 1966 our first international edition was released. International Clearinghouse Reports followed in 1967, 1968, 1970, 1972, and 1975. Their size increased from the original 40-page one to that in 1972 with its almost 1000 pages crammed with specific details on the operation and achievements of the numerous projects around the world. The Ninth Report, in 1975, was a departure from the earlier formats and consisted of one-page summaries of each of the science and mathematics curriculum projects that had been active within the 1956-1974 period and had responded at any point to our questionnaires.

The Tenth Report, which you are about to use, is now an even more inclusive document. It not only gives the complete detailed information on presently ongoing projects, it contains information on past projects that had not been included in earlier editions. To make it all-inclusive, it also has a complete reference directory of all the projects that have ever been covered in The International Clearinghouse Reports. We hope you find this report both valuable and highly informative and a proper complement to the earlier Reports. If you do we will have achieved a major objective.

Operation of The International Clearinghouse

The operation of The International Clearinghouse is a major undertaking that depends on the work of many people. The constant collecting of information and materials for the world-wide users of The International Clearinghouse involves a year-long activity and much correspondence and personal conversation. The major sources of information are the Project Directors and their staff members who are all very cooperative and who make such a comprehensive publication as this possible. They give their major input by answering a detailed questionnaire which is developed for each report from the questions The Clearinghouse is most frequently asked. Thus, every new report contains information not found in any of the others. This is one reason why it is important for interested organizations and individuals to maintain the complete series.

The materials produced by the numerous science and mathematics curriculum projects throughout the world are also collected and maintained at The International Clearinghouse which is housed within the University of Maryland's Science Teaching Center on the College Park campus. This site is just eight miles from downtown Washington, D.C., and is open throughout the work week for use by the numerous foreign and domestic visitors as well as the on-campus faculty and students. In addition to collecting curriculum "software", representative pieces of "hardware" from laboratory oriented projects are also maintained. As a natural extension of The International Clearinghouse operation, a four year "Study on Improvised Science Teaching Equipment Worldwide" (the IS-2 Study) was carried out from 1968-1972 culminating in three Guidebooks to Constructing Inexpensive Science Teaching Equipment: Biology; Chemistry; and Physics. The apparatus developed and tested during that study is also available for viewing. There are a number of other important activities of the Center which are described in detail in the following section.

The University of Maryland Science Teaching Center

The International Clearinghouse on Science and Mathematics Curricular Developments is located in the University of Maryland's Science Teaching Center at College Park, Maryland. Designed to serve as a representative facility of its type, the functions of the Science Teaching Center include teacher and supervisor education, graduate education, basic research in science education, and consultative services.

Some of the special projects that have been carried out by the STC staff or are still in operation, in addition to those of The International Clearinghouse, include: the reviewing activities of the National Science Teaching Association's Science Teaching Materials Review Committee; the Study of Inexpensive Science Teaching Equipment Worldwide (the IS-2 Study); the Chemistry Teaching Associates Program; the editing and coordinating of the UNESCO Source Book for Science Teaching and the UNESCO Handbook on Science Teaching; production, with the assistance of the ERIC Center on Science, Mathematics and Environmental Education at Ohio State, of international bibliographies on biological education and environmental education; the Academic Year Institutes for Science Supervisors; In-service and Summer Institutes in Biology, Chemistry, Physics, and Earth Sciences; training of Peace Corps Volunteers; and special conferences for national, state, and local groups.

In the spring of 1973 the STC played host to an ICSU/UNESCO International Conference on the Training of Teachers for Integrated Sciences. The 10-day working sessions attracted over 230 individuals from 63 countries. During the following 3 days a new cooperative organization was formed called The International Council of Associations for Science Education (ICASE). Its membership consists of an International Directory of Associations, and is now sponsoring a UNESCO Science Teachers Handbook to supplement the recently released New UNESCO Source Book on Science Teaching which was also coordinated at the Maryland Science Teaching Center. The 1976 ICASE General Assembly Meeting was held in Oxford, England and the next one is planned for The Netherlands in the spring of 1978.

The facilities include well-equipped science teaching rooms used for methods courses, a research and special projects room, a vivarium, an extensive science education library, preparation rooms, photography darkrooms, and The International Clearinghouse permanent collection room. In addition we share facilities with the Educational Technology Center that include a construction shop, graphic arts shop, audio-visual center, audio-tutorial center, ETV center, and multi-media rooms. The Science Teaching Center has close ties with other departments on campus, particularly with the academic science departments where our faculty members hold joint appointments in botany, chemistry, environmental education, geology and physics.

Each year the Science Teaching Center is host to large numbers of domestic and foreign visitors. Guests have the opportunity to examine the latest materials from national and international science and mathematics curriculum projects which are collected in The International Clearinghouse. Every attempt is being made to keep the collection as comprehensive as possible and it is believed to be one of the most up-to-date compilations of such materials in the world. The International Clearinghouse and the Science Teaching Center shall continue to welcome and to aid visitors of every nation and all areas at all levels of science and mathematics education, since it has as a basic aim the promotion of international cooperation through the dissemination of information.

Acknowledgments

After the information is all gathered together for any one report, editing and compilation is done within The International Clearinghouse operation by the Director and a few staff members. For this Tenth Report the two research assistants who were crucial to its production were Charlene Pritzker and Susan Snyder. They assisted along each step of the way and were particularly effective in the editing process. My special thanks goes to them for their tireless contributions.

Of invaluable assistance to any on-going operation is the secretarial staff that supports the program. In this regard I am highly indebted to a number of wonderful persons in this category. During the past four years Leah Zimmerman, my administrative assistant, was the mainstay of The International Clearinghouse and of the Science Teaching Center. Her contributions are just too numerous to mention. We all give her our heartfelt thanks and wish her well in her new duties.

Assisting us very ably during those four years was Beverly Ray Keder, an undergraduate student serving as a part-time secretary. For the last year a third member of the team, Nancy Woodard, served as a highly capable full-time secretary who shared in all the duties, too. Two undergraduates still with us, and continuing their fine work, are Rosalind Spruell and Sujatha Ivatury. We thank them all and any others we might have inadvertently overlooked.

At the present time I have an excellent replacement for Leah Zimmerman in the form of Irene Salazar who has taken on her new duties in a very efficient manner. And her close secretarial colleague with the Science Teaching Center aspects is Brenda Bigwood whose work is also prized. It is to such good support staff, including our present workstudy students, that credit really needs to go in operations such as this one.

We are, of course, very much indebted to the numerous science and mathematics curriculum project staffs around the world and thank them for their fine input. Along with them, individual staff members of the National Science Foundation (the organization who furnishes the financial support), the AAAS, the British Council in London, and UNESCO in Paris are of tremendous help. Our lead contact persons with these organizations who contribute so much to the success of this work are Daniel Yohe (NSF), Arthur Livermore(AAAS), Dennis Chisman (British Council), and Sheila Haggis (UNESCO). The contributions of each of them and their professional colleagues is essential to this work.

Another group that we work with regularly, as their "international satellite", is the ERIC Center for Science, Mathematics and Environmental Education at The Ohio State University, Columbus, Ohio. Our thanks go to Bob Howe and his colleagues for their on-going cooperation.

And last, but certainly not least, I want to acknowledge the important and on-going work of the faculty and graduate assistants of the Science Teaching Center at the University of Maryland who not only contribute to the production of these biennial publications, but also serve as hosts and hostesses for our numerous domestic and foreign visitors. All of them have personal contacts throughout the world so they too get involved with the heavy load of correspondence associated with such a major operation. The faculty members of the Science Teaching Center of the University of Maryland during the past two years to whom we want to pay our most appreciative thanks are: Barbara Benning, Glenn Blough, Maureen Dietz, George Eley, Marjorie Gardner, Henry Heikkinen, John Layman, Robert Ridky, Dennis Sunal, Jack Wheatley, David Williams and Emmett Wright. Graduate student staff members making similar contributions included Pam Splaine and Helen Tonetti. Without these fine people and their predecessors there would be no University of Maryland Science Teaching Center. Thanks go to Jim Donnelly for the cover design.

You, as a reader of this Report are also an important contributor to the on-going activities of The International Clearinghouse. Your comments and suggestions are encouraged. Please tell us how we might best serve you. And visit us when you can.

The International Clearinghouse
Science Teaching Center
University of Maryland

J. David Lockard, Ph.D.
Director
January, 1977

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I. KEY TO THE INFORMATION ON THE PROJECT DESCRIPTIONS

OFFICIAL PROJECT TITLE AS FURNISHED
BY THE DIRECTOR (ACRONYM)

Address to use when
writing for additional
project information

Telephone: Telephone number
for contacting project for
more information

Director: Names of past or present project director, co-directors or contacts

Project Duration: Year project began and year it ended

Additional information, see also Clearinghouse Reports: (volume numbers) and the 20-Year Cumulative Directory for related or former titles, if applicable

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Age: of students involved
Ability: ability level
Subject: subject areas covered
Language: original language
Translations: other languages
Testing of Students: (includes)
- Written achievement tests
- Laboratory performance tests
- Oral tests
- Standardized tests
- Teacher judgments
- Student attitude questionnaire
- Interest inventories

Materials Developed by Project:

(includes)

Print
- Textbooks
- Lab Books
- Supplementary Books
- Programmed Units
- Activity Sheets
- Teacher Manuals
- Field Guides
- Evaluation Materials (tests)
- Behavioral Objectives
- Overview of Project
- Newsletters
- Charts

Non-Print
- Slides
- Filmstrips
- Filmloops
- Films
- Overhead Transparencies
- Videotape
- Slide Tape
- Audiotape
- Records
- Games
- Models
- Lab Equipment

Types of Learning Experiences:

(includes)
- Lecture
- Seminar
- Discussion
- Independent Study
- Laboratory Activities
- Field Experiences
- Demonstrations
- Simulations
- Audio/Visual

NARRATIVE: This section includes: director's responses to questions involving personnel, project history and development, objectives, and unique characteristics of the project; detailed list of materials produced including sources and costs; summary of teacher training materials and services, project evaluation, research and publicity; discussion of recent project activities and plans for the future.

ABBREVIATIONS USED IN PROJECT REPORTS

Subject:

Biology	bio
Chemistry	chem
Computer Science	computer sci
Educational Technology	ed tech
Engineering/Technology	eng/tech
Environmental Science	envir sci
Mathematics	math
Physics	phys
Social Science	soc sci

Testing of Students:

Laboratory performance tests	lab performance tests

Materials Developed by Project:

Print

Evaluation Materials	Eval. Materials
Overview of Project	Overview
Teacher Manuals	Tchr. Manuals

Non-Print

Overhead Transparencies	Overhead Trans.

Types of Learning Experiences:

Laboratory Activities	Lab. Activities

II. KEY FOR THE INDEX AND CUMULATIVE DIRECTORY ABBREVIATIONS

SUBJECT

agr-e	agricultural education
an	anthropology
art	art
astr	astronomy
b	biology
b-e	business education
b-s	behavioral sciences
c	chemistry
c-e	career education
c-s	computer science
com	communications
comp	computing
cyb	cybernetics
e-e	environmental education
e-p	environmental planning
e-s	earth-space
ec	economics
ecol	ecology
ed	education
ed-t	educational technology
el-s	elementary science
electric	electricity
electro	electronics
Eng	English
eng-s	engineering science
eng-t	engineering technology
f	forestry
g	geography
g-s	general science
geol	geology
h	health
h-e	home economics
h-s	history of science
hist	history
hu	humanities
i-a	industrial arts
integ	integrated
integ-s	integrated science
l-a	language arts
m	mathematics
m-s	marine science
mat	materials
med	medicine
meth	methods
mus	music
n-s	natural science
naut-s	nautical science
nuc-s	nuclear science
nutr	nutrition
p	physics
p-a	performing arts
p-e	physical education
p-s	physical science
phys	physiology
phil	philosophy
pr-s	primary science
psych	psychology
psych-ed	psychology education
r	religion
s	science
s-ed	science education
s-o	subject-oriented
s-s	social sciences
sur	survival
t	technology
u-s	urban studies
w-r-m	water resources management

ABILITY

avg	average
avg+	above average
all	all levels
EMR	educationally mentally retarded
EMH	educationally mentally handicapped
slow	slow learner
spec	special education
u-a	underachievers

AGES

TEd	teacher education

III. INDEX TO THE PROJECTS

Projects are listed alphabetically by country of origin. Countries are arranged on the basis of strictly geographical considerations into continental areas, as identified in major atlases.

AFRICAN AREA

	Subject	Ages	Ability	Page
BOTSWANA				
SCIENCE BY INVESTIGATION IN BOTSWANA	integ-s	12-15	avg+	1
ETHIOPIA				
NEW SCIENCE CURRICULUM	b,c,p,e-s	6-18	all	3
GHANA				
PROJECT FOR SCIENCE INTEGRATION (PSI)	integ-s	12-14	all	5
KENYA				
KENYA PRIMARY MATHEMATICS	m	6-12	all	7
KENYA PRIMARY SCIENCE (KPS)	s	6-12	avg+	9
NIGERIA				
UNIVERSAL PRIMARY EDUCATION TEACHER EDUCATION MATERIAL PRODUCTION PROJECT	g-s	TEd	all	11
SIERRA LEONE				
CORE COURSE INTEGRATED SCIENCE (CCIS)	b,c,p,e-s,	13-15	all	13
REGIONAL AFRICAN PROJECTS				
SCIENCE EDUCATION PROGRAMME FOR AFRICA (SEPA)	b,c,p,t	6-12	all	15
WEST AFRICAN A-LEVEL BIOLOGY	b	16-18	all	18

ASIAN AREA

INDIA				
VIKRAM A. SARABHAI COMMUNITY SCIENCE CENTRE (VASCS)	b,c,p,m, e-s,ed-t	9-17	all	20
INDONESIA				
DEVELOPMENT SCHOOL PROJECT PROYEK PERINTIS SEKOLAH PEMBANGUNAN (PPSP)	b,c,p,m, e-s,s-s	6-17	all	25
ISRAEL				
AGRICULTURE AS ENVIRONMENTAL SCIENCE PROJECT (AES)	b,s-s,agre-e, e-e,en-s	11-16	all	28
EXPERIMENTAL PHYSICS PROGRAMME FOR SECONDARY SCHOOLS (REHOVOT PHYSICS GROUP)	p	15-18	avg+	32
ISRAEL ELEMENTARY SCIENCE PROJECT (MATAL)	b,c,p,e-s	5-11	all	35
ISRAEL HIGH SCHOOL BIOLOGY PROJECT (IHBP)	b	14-17	all	38
ISRAEL SCIENCE TEACHER EDUCATION PROJECT (ISTEP)	b,c,p,e-s	TEd	all	41
PHYSICS-CHEMISTRY PROJECT (IN ISRAEL)	c,p	12-17	avg, avg+ slow	43
JAPAN				
BIOLOGY CURRICULUM DEVELOPMENT AND EVALUATION (BCDE)	b	15-17	all	45
STUDIES ON THE INTEGRATED SCIENCE CURRICULUM	b,c,p,e-s, s-s	12-17	all	47

	Subject	Ages	Ability	Page
JAPAN (continued)				
THE STUDY TO MODERNIZE THE PHYSICS CURRICULUM OR UPPER SECONDARY SCHOOLS (KBGK Project)	p	16-17	avg	49
LEBANON				
EDUCATIONAL TELEVISION (ETV)	b,c,p,m,e-s, s-s,ed-t	5-adult TEd	all	51
INTERMEDIATE SCHOOL SCIENCE PROJECT (ISSP)	b,c,p,e-s	11-14 TEd	all	53
PRIMARY SCHOOL MATHEMATICS PROJECT (PSMP)	m	6-10 TEd	all	56
PRIMARY SCHOOL SCIENCE PROJECT (PSSP)	b,c,p,e-s	6-10 TEd	all	58
MALAYSIA				
MALAYSIAN GENERAL SCIENCE PROJECT (MGSP)	b,c,p	TEd	avg-	60
REPUBLIC OF CHINA (TAIWAN)				
CHINESE JUNIOR SECONDARY SCIENCE PROGRAM (CJSSP)	b,c,p,e-s	12-14	avg	63
ELEMENTARY SCHOOL MATHEMATICS CURRICULUM DEVELOPMENT PROJECT OF REPUBLIC OF CHINA (ESMCD)	m	6-11	all	65
THE ELEMENTARY SCIENCE CURRICULUM DEVELOPMENT PROJECT (ESCD)	b,c,p,m	6-11	all	67
IMPROVEMENT OF EVALUATION IN SCIENCE TEACHING	b,c,p,m	12-14	avg	69
SINGAPORE				
LOWER SECONDARY SCIENCE CURRICULUM DEVELOPMENT PROJECT (LSS)	e-e	7-14	all	71
THE PRIMARY PILOT PROJECT (PPP)	c,p	6-12	all	74
THAILAND				
THE INSTITUTE FOR THE PROMOTION OF TEACHING SCIENCE AND TECHNOLOGY (IPST)	b,c,p,m, g-s,p-s	6-17	avg avg+	76
ASIAN REGIONAL PROJECTS				
INTEGRATED SCIENCES AT THE INTERMEDIATE SCHOOLS IN THE ARAB STATES	integ.	13-15	all	80
PILOT PROJECT FOR BIOLOGY TEACHING AT THE SECONDARY SCHOOLS IN THE ARAB STATES	b	16-18	all	82
AUSTRALIAN AREA				
AUSTRALIA				
EDUCATION DEPARTMENT OF WESTERN AUSTRALIA LOWER SECONDARY SCIENCE PROJECT (LSS)	b,c,p,e-s	13-15	all	84
NEW SOUTH WALES JUNIOR SCIENCE INSERVICE PROJECT	integ-s	TEd	TEd	88
"PHYSICAL SCIENCE - MAN AND THE PHYSICAL WORLD"	p-s	16-17	avg	90
PRIMARY SCIENCE SCHEME OF THE TERRITORY (PSST)	g-s	5-11	all	92
FIJI				
BASIC SCIENCE, PHYSICAL SCIENCE AND BIOLOGICAL SCIENCE	b,c,p,e-s, e-e,s-s	11-16	all	95

	Subject	Ages	Ability	Page
FIJI (continued)				
PHYSICAL SCIENCE (FIJI OPTION) FOR N. Z. SCHOOL CERTIFICATE	p-s	16	avg	98
PAPUA AND NEW GUINEA				
MATHEMATICS LEARNING PROJECT (MLP)	m	17+	avg+	101
SECONDARY SCIENCE PROJECT	g-s	12-15	avg	104
SOLOMON ISLANDS				
SOLOMON ISLANDS/UNESCO PRIMARY SCIENCE (SIEAS)	m,p,e-s,b, e-e	5-13+ TEd	all	106
EUROPEAN AREA				
BELGUIM				
CENTRE BELGE DE PEDAGOGIE DE LA MATHEMATIQUE	m	6-18+	all	109
DENMARK				
ASK NATURE	c,p	12-15	all	112
FRANCE				
INITIATION AUX SCIENCES ET TECHNIQUES (IST)	c,p,e-s,en-t	11-14	all	114
GREAT BRITAIN: ENGLAND				
ADVANCED PHYSICS PROJECT FOR INDEPENDENT LEARNING (APPIL)	p	18-20	avg avg+	116
COMPUTER BASED LEARNING PROJECT	c,m,s-s,ed-t	9-18	avg, avg+	118
CONCEPTS IN SECONDARY SCHOOL MATHEMATICS AND SCIENCE (CSMS)	b,c,p,m	10-16	all	121
CONTINUING MATHEMATICS PROJECT	m	16-18	all	123
ENVIRONMENTAL EDUCATION STUDY	e-e	5-20	all	126
HIGHER EDUCATION LEARNING PROJECT (PHYSICS)	p	18+	avg+	128
INNER LONDON EDUCATION AUTHORITY 11-13 SCIENCE	b,c,p	11-14	all	130
MATHEMATICS 5-11	m	4-11	all	132
MATHEMATICS CURRICULUM: A CRITICAL REVIEW SCHOOLS COUNCIL PROJECT	m	12-16	all	134
NATIONAL DEVELOPMENT PROGRAMME IN COMPUTER ASSISTED LEARNING (NDPCAL)	b,c,p,m,c-s, med,nuc-s,g, hist	9-12 adult	all	136
NUFFIELD COMBINED SCIENCE CONTINUATION PROJECT	b,c,p,e-s	9-12	all	139
NUFFIELD O-LEVEL PHYSICS TEACHING PROJECT-REVISION	p	8-12	avg avg+	141
NUFFIELD "WORKING WITH SCIENCE"	s,s-s	16-19	avg, avg+	143
PHYSICAL SCIENCES PROGRAM EXCHANGE (PSPE)	b,c,p,ed-t	adult	avg, avg+	145
SCHOOLS COUNCIL CITY SCENE PROJECT SCIENCE FOR THE LESS ABLE PUPIL	b,c,p	14-16	slow	147
SIXTH FORM MATHEMATICS PROJECT (6 FMC)	m	16-18	all	149
TEACHING SCIENCE OUTDOORS	b,c,p,m	11-15	avg	151

	Subject	Ages	Ability	Page
GREAT BRITAIN: SCOTLAND				
DEVELOPMENT OF IDEAS IN MATHEMATICAL EDUCATION PROJECT (DIME PROJECTS)	m	5-adult	all	153
FIFE MATHEMATICS PROJECT	m	11-13	all	155
FURTHER AND HIGHER EDUCATION SERVICE MATHEMATICS (MATLAB)	m	17+	avg	157
MATHEMATICS FOR GENERAL EDUCATION	m,s-s	14-16	slow	160
SCIENCE IN S1 AND S2	b,c,p	12-13	all	162
SCOTTISH EDUCATION DEPARTMENT MATHEMATICS EXPERIMENT	m	12-16	all	164
GREAT BRITAIN: WALES				
EARLY STAGES OF MATHEMATICAL DEVELOPMENT WITH YOUNGER CHILDREN (3 years to 9 years)	m	5-9	all	166
HUNGARY				
OPI MATHEMATICAL REFORM PROJECT	m	5-18	all	168
IRELAND				
INTEGRATED SCIENCE CURRICULUM INNOVATION PROJECT (ISCIP)	b,c,p,t, e-s,s-s	12-15 TEd	all	170
ITALY				
INIZIATIVA RELATIVITA (IR)	p	17-18+	all	172
THE STRUCTURE OF MATTER (AN ACTIVITY BASED SCIENCE COURSE)	b,c,p, integ.	14-15	all	175
THE NETHERLANDS				
ACHIEVEMENT TESTS FOR PHYSICS, MATH AND CHEMISTRY	p,c,m	14-17	avg,avg+	177
PHYSICS CURRICULUM DEVELOPMENT PROJECT FOR GENERAL SECONDARY EDUCATION (PLON)	p	13-15	avg,avg+	180
NORWAY				
ACTIVE PHYSICS/CHEMISTRY PROJECT AND ACTIVE BIOLOGY	c,p,b	13-16		182
ENVIRONMENTAL EDUCATION IN PRIMARY SCHOOL	integ. e-e	5-11	all	184
SWITZERLAND				
DEVELOPMENT AND CORRESPONDING ANALYSIS OF THE CURRICULUM FOR CONTINUING SCHOOLS IN ZUG (EBAC-WS)	h,s-s,l-a, integ.	15-16	avg	186
WEST GERMANY				
ANALYSIS OF THE EVOLUTION OF A SCIENCE CONCEPT: MACROMOLECULES	b,c,p,s-s, hist	TEd		188
ECOLOGICAL AND ENVIRONMENT EDUCATION	b,c,p,e-s, s-s	2-20	all	190
INTEGRATED NATURAL SCIENCE CURRICULUM (PINC)	b,c,p,t	12-15	all	193
IPN-LEHRGANG "STOFFE UND STOFFUMBILDUNGEN" 8/13	c,p	8-12	avg+	196
PROGRAM NATURWISSENSCHAFTEN (SCIENCE PROGRAM)	g-s	5-7 TEd	all	199

	Subject	Ages	Ability	Page
WEST GERMANY (continued)				
SCIENCE EDUCATION FOR GRADE 11-13 WITH BOTH VOCATIONAL AND ACADEMIC EMPHASIS	b,c,p,s-s, eng-t	10	all	201
UNIT BANK BIOLOGY	b,c,m,cyb s-s	9-17	avg	203

LATIN AMERICAN AREA

	Subject	Ages	Ability	Page
BRAZIL				
INTEGRATED SCIENCE	b,c,p,m,e-s, s-s,t,integ.	15-16	all	206
SCIENCE MATHEMATICS AND SOCIAL STUDIES - 1ST GRADE (CESM)	m,b,c,s-s,p	6-13	avg	208
TECHNICAL TEACHING OF ELECTRONICS (PEPE)	p,ed-t eng-t	15-17	avg	210
CHILE				
PROYECTO DE PERFECCIONAMIENTO EN SERVICIO, CIENCIAS NATURALES (PPS-CN)	b,c,p,e-s	10-13 TEd	all	212
VIRGIN ISLANDS				
ENVIRONMENTAL STUDIES PROGRAM (ESP)	e-e	8-13 adult	all slow	215
WEST INDIES REGIONAL				
CARIBBEAN INTEGRATED SCIENCE CURRICULUM (CISC)	integ-s	15-16	avg+	218

NORTH AMERICAN AREA

	Subject	Ages	Ability	Page
CANADA				
PATTERNS OF ENQUIRY PROJECT (POEP)	b,c,p	14-17 TEd		220

UNITED STATES OF AMERICA

	Subject	Ages	Ability	Page
AIDS TO INDIVIDUALIZE THE TEACHING OF SCIENCE (AITS)	b,c,p,e-s	13-18	all	222
ANTHROPOLOGY CURRICULUM PROJECT (ACP)	an	6-18	all	225
THE AVIOLOGY CONCEPT PROGRAM	b,c,p,m, e-s,s-s, unified sci., aviation focus	14-18	all	228
BIOLOGICAL SCIENCES CURRICULUM STUDY - HUMAN SCIENCES PROGRAM (HSP)	b,s-s,b-s	11-14	all	230
BIOLOGICAL SCIENCES CURRICULUM STUDY - ME AND MY ENVIRONMENT (MAME)	e-e,e-s, b,c,p	13-18	EMH slow	233
BIOLOGICAL SCIENCES CURRICULUM STUDY - ME IN THE FUTURE	b,c,p,e-s	14-18	EMH slow	239
BIOLOGICAL SCIENCES CURRICULUM STUDY - ME NOW	b	10-14	EMH slow	241
BIOMEDICAL INTERDISCIPLINARY CURRICULUM PROJECT (BICP)	b,c,p,m, med,s-s, t,c-s	16-18	avg avg+	244
BROAD SPECTRUM ENVIRONMENTAL EDUCATION PROJECT	e-e	5-18	all	247
CALCULUS BASED PHYSICS MODULES	p	18+	avg+	249
CAREER ORIENTED PRE-TECHNICAL PHYSICS (COPP)	p	16-18	avg	251
CHEMICAL BOND APPROACH PROJECT REVISION (CBA)	chem	16+	avg,avg+	253
CHEMICAL ENGINEERING MODULAR INSTRUCTION (CHEMI)	ed-tech,e-s, en-tech	18+	avg	254
CITIZENS AND SCIENCE EDUCATION STUDY (CASE)	b,c,p,s-s, el-s,m,phil	5-adult	all	256
COLLEGE SCIENCE IMPROVEMENT PROGRAM (COSIP)	b,c,p,m,e-s	18+	all	258
COMMUNITY LEADERS TRAINING IN ENVIRONMENTAL STUDIES	e-s,s-s,b	adult	all	260
COMPREHENSIVE SCHOOL MATHEMATICS PROGRAM (CSMP)	m	6-18	all	262
COMPUTER INTEGRATION IN THE MATHEMATICS CLASSROOM	m	15-18	avg avg+	273
CONSERVATION AND ENVIRONMENTAL STUDIES, INC. (CESC, INC.)	e-s	5-adult	all	275
CURRICULUM MODIFICATION THROUGH ENVIRONMENTAL STUDIES	e-e	5-14	all	280
DEVELOPING MATHEMATICAL PROCESSES (DMP)	m	5-11	all	283
DEVELOPMENT OF COMPETENCY BASED MODULAR EXPERIMENTS IN POLYMER SCIENCE AND TECHNOLOGY (MOD)	c,mat	18+	avg avg+	287
EDUCATION AND EXPERIENCE IN ENGINEERING (E^3)	c,p,s-s, m,en-t	18+	avg+	289
EDUCATIONAL MODULES FOR MATERIALS SCIENCE AND ENGINEERING (EMMSE)	mat-s,en	18+	avg+	291

	Subject	Ages	Ability	Page
EDUCATIONAL RESEARCH COUNCIL MATHEMATICS PROGRAM (ERCMP)	m	5-18	all	294
EDUCATIONAL RESEARCH COUNCIL (ERC) UNIFIED SCIENCE PROGRAM	b,c,p,m, e-s,s-s,t, psych,hu	12-18	all	297
ELEMENTARY MATHEMATICS CONCEPTS WITH CALCULATORS (EMC^2)	m	4-12	all	301
ELEMENTARY SCIENCE TEACHER TRAINING (ESTT)	b,c,p, e-s,hu	18-20	avg	336
ENVIRONMENTAL EDUCATION	b,c,m,e-s, s-s,en-t, l-a,ed-t,art	5-adult	all	303
ENVIRONMENTAL EDUCATION SERVICE CENTER (EESC)	e-e	5-adult	all	305
ENVIRONMENTAL SCIENCE CONCEPTS AND PROCESSES--ENQUIRY (ESCAPE)	e-e,s	11-13	all	307
FEDERATION FOR UNIFIED SCIENCE EDUCATION (FUSE)	s	5-adult	all	310
FOUNDATIONAL APPROACHES IN SCIENCE TEACHING (FAST)	b,c,p,t, e-s,s-s	12-17	all	312
GEOGRAPHY CURRICULUM PROJECT (GCP)	g	6-15	all	315
HAWAII MARINE STUDIES SCIENCE (HMSS)	b,c,p,m-s, e-s,ed-t	16-18	all	317
HAWAII MARINE STUDIES SOCIAL SCIENCE (HMSSoSi)	s-s	16-18	all	319
HAWAII METRIC PROJECT	m	5-12	all	321
HAWAII NATURE STUDY PROJECT	e-e	5-12	all	323
HEALTH ACTIVITIES PROJECT (HAP)	h	10-13	all	325
HIGH SCHOOL POLITICAL SCIENCE CURRICULUM PROJECT - COMPARING POLITICAL EXPERIENCES (CPE)	s-s	16-18	all	328
HISTORY OF PHYSICS LABORATORY	p	16+		332
HUMAN BEHAVIOR CURRICULUM PROJECT FOR SECONDARY SCHOOLS (HBCP)	b-s	16-18	avg	334
HUMANISTIC APPROACH TO NATURAL SCIENCE (HANS)	b,c,p, e-s,hu	18-20	avg	336
INDIVIDUALIZED INSTRUCTION IN MATHEMATICS	m	13-18	all	338
INDIVIDUALIZED SCIENCE (IS)	b,c,p	5-14	all	341
INDIVIDUALIZED SCIENCE INSTRUCTIONAL SYSTEM (ISIS)	b,c,p,e-s	14-18	avg	345
INTEGRATED SEQUENCE FOR HIGH SCHOOL MATHEMATICS	m	13-17	avg avg+	347
INTENSIVE MODULAR SHORT COURSES IN CHEMISTRY	c	adult	avg avg+	349
INTERRELATED EXPLORATIONS IN SCIENCE (IES)	b,c,p,e-s	11-13	all	351
ISSUE ORIENTED MODULES	p	18+	all	354
THE MADISON PROJECT	m	7-16	all	356
MARINE ENVIRONMENTAL STUDIES PROGRAM	m-s	16-18	avg avg+	359

	Subject	Ages	Ability	Page
METRE AND LITRE ARE NEATER	m	adult	all	361
MOUNTAIN VIEW CENTER FOR ENVIRONMENTAL EDUCATION	e-e	5-12	all	363
MULTIMEDIA APPROACH TO SCIENCE STUDIES: STUDENT DEVELOPED RESOURCE CENTERS (MASS)	b,c,p	9-13	avg	365
NATURE OF EVIDENCE (MIDNEV)	b,c,p,s-s, geol,phil	18-20	avg	368
OUTDOOR BIOLOGY INSTRUCTIONAL STRATEGIES (OBIS)	b,e-e	10-15	all	371
P. K. YONGE LABORATORY SCHOOL CORRELATED SCIENCE PROGRAM (CSP)	b,c,p,e-s	15-17	all	375
PEST POPULATION ECOLOGY, AN INTER-UNIVERSITY TRAINING PROGRAM	b	18+		378
PHYSICAL PROCESSES IN TERRESTRIAL AND AQUATIC ECOSYSTEMS	b,p,m, e-e,c-s	adult	avg+	380
PHYSICAL SCIENCE MODULES FOR BIOSCIENCE STUDENTS (PSMBS)	c,p	adult	all	382
PHYSICS 111X	p	18+	all	384
PRESUMPSCOT RIVER EDUCATION PROGRAM FOR AWARENESS OF THE REGIONAL ENVIRONMENT (PREPARE)	e-e	15-18	avg	386
PRIMARY ENVIRONMENTAL EDUCATION PROGRAM (PEEP)	e-e	5-9	all	388
PROBLEM ORIENTED PHYSICS INSTRUCTION	p	18+	all	390
THE PROCESS MODULES FOR INVESTIGATING ENVIRONMENTAL PROBLEMS	e-e	10-14	avg avg+	392
PROJECT ENRICH - THE USE OF VOLUNTEERS IN TEACHING ECOLOGY	e-e	5-14 16-adult	all EMH	394
PROJECT MER (MARINE ECOLOGY RESEARCH)	b,c,m-s	13-18	all	397
REGIONAL CENTER FOR PRE-COLLEGE MATHEMATICS CURRICULUM PROJECTS	m	6-adult	all	400
SCIENCE FOR THE SEVENTIES AND INSTRUCTIONAL TELEVISION (SFTS-ITV)	el-s	5-12	all	402
SELF PACED TUTORIAL COURSES FOR MINERAL SCIENCE - METALLURGY DEPARTMENTS	en-t	adult	all	404
SPATIAL ANALYSIS OF LAND USE PROJECT	g	adult	avg+	406
STRUCTURING MATHEMATICS FOR INDIVIDUALIZED LEARNING EXPERIENCES (SMILE)	m	5-12	all	408
STUDENT CONCERNED ABOUT TOMORROW'S ENVIRONMENT (SCATE)	e-e,s-s	13-18	all	411
SUCCESS IN MATHEMATICS THROUGH AURAL READING TECHNIQUES (SMART)	m	10-13	all	414
TECH PHYSICS PROJECT (PRODUCT: PHYSICS OF TECHNOLOGY MODULES)	p	18+	all	416
UNIFIED SCIENCE AND MATHEMATICS FOR ELEMENTARY SCHOOLS (USMES)	b,c,p,m, t,s-s,l-a	6-14	all avg+	419
UNIVERSE AND I (U & I)	e-s	11-14	all	423
UPPER MISSISSIPPI RIVER ECO-CENTER	e-e	10-12		425
WATERSHED HERITAGE PROJECT	e-e	12-adult	all	427
WHAT PEOPLE EAT - WHY PEOPLE EAT	b,c,nutr	17+	all	431

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IV. DIRECTORS OF PROJECTS OUTSIDE THE UNITED STATES

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VI. PROJECT DESCRIPTIONS LISTED ALPHABETICALLY BY GEOGRAPHICAL AREA

SCIENCE BY INVESTIGATION IN BOTSWANA

Ministry of Education
P/Bag 005
Gaborone, BOTSWANNA
Africa

Telephone: Gaborone 5381

Director: George Makunga

Project Duration: 1973-

Age: 12-15
Ability: above average
Subject: Integrated science
Language: English
Translations: none
Testing of Students: written achievement tests, Lab. performance tests

Materials Developed by Project:

Print	Non-Print
Activity Sheets	Lab. equipment
Tchr. Manuals	
Eval. Materials	

Types of Learning Experiences:

Lab. Activities
Small group practical work

PRINCIPAL PROFESSIONAL STAFF:

George Makunga
D. C. Sanders, British Council
Botswana National Science Panel

PROJECT HISTORY:

Principal Initiator(s): Ministry of Education, British Council

Reason(s) for Project Initiation: Need for better Junior Secondary Science Course.

Evolution and Development of the Project: Based upon Scottish Integrated Science Course "Science for the 70's". Course in Botswana developed in conjunction with Lesotho and Swaziland. Development aided by British Council.

PROJECT OBJECTIVES:

Overall Project Purpose:

To give a complete science course in 3 years.
Give foundation for students going on to more advanced studies.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Botswana Secondary Pupils Forms I, II and III (ages 12-15), intellectually they form top 20%.

Ways in which it differs from similar or previous programs: It is a course which is fully integrated combining the various science disciplines. It is an experimental discovery based course.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Teachers' Guides 15 units	Not given	Ministry of Ed.
Worksheets for pupils 15 units	"	"
Textbook in production for use with course in Botswana	"	Heinemann

PRESENT COMMERCIAL AFFILIATIONS:

Heinemann, U. K. - producing textbook, based upon work from local authors.

MATERIALS AVAILABLE FREE:

Worksheets and Teachers' Guides in limited quantities from Ministry of Education in Gaborone.

ADDITIONAL MATERIALS BEING DEVELOPED: Worksheets and Guides are being revised.

SCIENCE BY INVESTIGATION IN BOTSWANA (2)

TEACHER PREPARATION:

Consultant Services: Science office is Ministry of Education; only 20 schools (70 teachers) are involved.

Pre-service and In-service Training:

In-service workshop 1-2 weeks
1 day workshops
Financed by Ministry of Education/British Council

PROJECT EVALUATED:

Yes ____ No X Internal ____ External Agency ____

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Revise course.

NEW SCIENCE CURRICULUM

Science Curriculum Development Centre
Curriculum & Supervision Department
Ministry of Education
P. O. Box 1367
Addis Ababa, ETHIOPIA

Director: Ato Ahmed Karrar

Project Duration: 1969-

Age: 6-18
Ability: all
Subject: Biol, chem, phys, earth-space
Language: English, Amharic
Translations: none
Testing of Students: written achievement tests

Materials Developed by Project:

Print	Non-Print
Textbooks	Radio Magazine
Lab Books	
Tchr. Manuals	
Behavioral Objectives	

Types of Learning Experiences:
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Demonstrations
- Simulations

PRINCIPAL PROFESSIONAL STAFF:

Mr. H. K. Macrae, Science Education Adviser (Physical Science)
Dr. M. R. Ingle, Science Education Adviser (Biological Science)

PROJECT HISTORY:

Principal Initiator(s): Ministry of Education(Ethiopia) and British Council

Reason(s) for Project Initiation: Improvement of science education in schools.

Evolution and Development of the Project: Developed from the East African Secondary Science Project, using inquiry approach. Principal effort so far has been in the production of student's texts, teacher's guides, and workbooks.

PROJECT OBJECTIVES:

Overall Project Purpose:

To base the course on the immediate environment of the child.
To link science with other academic areas and the local environment.
To use the inquiry approach to offset the handicaps of formal methods when learning in a second language.
To train in scientific methods.
To effect transfer of training from school science to everyday situations.
To develop moral and ethical values.

Specific Objectives: Each topic of study is contained in a Unit (e.g. "Food and Energy") which has its own specific behavioral objectives.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All levels and ability groups, grades 1-12 (ages 6-18). The course is graded and progressive in difficulty.

Ways in which it differs from similar or previous programs:

General philosophy similar to East African Secondary Science Project, but uses local materials. Grades 6, 8, and 10 are terminal courses.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Student's Texts for Primary Science Grades 1-4.	Avail. Subsidized cost for students	Ministry of Ed.
Student's Texts for Grades 7 and 8 (Science Comes to life) Two volumes.		"
Student's Texts for Grade 9 (Biological Science and Physical Science) Two Volumes	"	"
Workbooks for all of the above (Eight volumes).	"	"
Teacher's Guides for all of the above (Eight volumes)	Free	"

NEW SCIENCE CURRICULUM (2)

PRESENT COMMERCIAL AFFILIATIONS:

Ministry of Education, P. O. Box 1367, Addis Ababa, Ethiopia.
Attention: Materials Production and Distribution Unit

MATERIALS AVAILABLE FREE: Teacher's Guides

ADDITIONAL MATERIALS BEING DEVELOPED:

Laboratory Equipment
Radio Programs to accompany courses
Background Readers

TEACHER PREPARATION:

Consultant Services:

By correspondence.
Science Curriculum Development Centre Library and consultancy service available to visiting teachers.
By visits to schools.

Pre-service and In-service Training:

In-service workshops
Pre-service by collaboration with Teacher Education Department of Ministry of Education.

Pre-service and In-service Teaching Materials: Teacher's guides for all textbooks.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Pertinent Research Studies: None

In-House of Unpublished Research: Information not yet available.

Availability of Evaluative Data: Information not yet available.

PROJECT PUBLICITY: None

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE: Publication of materials scheduled for completion 1978.

PROJECT FOR SCIENCE INTEGRATION (PSI)

Ghana Association of Science Teachers (GAST)
Secretariat
c/o Ghana Education Service
Inspectorate Division
P.O. Box M 188
Accra, GHANA

Telephone: 28333 Accra

Director:

Project Duration: 1970

Age: 14-15
Ability: all
Subject: integ sci.
Language: English
Translations: none
Testing of Students:
written achievement tests

Materials Developed by Project:

Print	Non-Print
Lab Books Tchr. Manuals Pupil's Workbook	

Types of Learning Experiences:
Discussion
Lab Activities
Demonstrations
Field Experiences

PRINCIPAL PROFESSIONAL STAFF: Not answered

PROJECT HISTORY:

Principal Initiator(s): Ghana Association of Science Teachers (GAST)

Evolution and Development of the Project: Plans were made at the Takoradi workshop for a comprehensive development of science education at all levels of pre-university education. These have been implemented so far for the first two years of secondary school only. Developed materials have gone through two phases of trial and evaluation. The final revisions are to take place in 1976.

PROJECT OBJECTIVES:

Overall Project Purpose: To make science meaningful to the pupil and to lay a reliable foundation for further O-level courses.
Science will be meaningful if it develops in the individual
- a) Confidence for independent inquiry and action towards practical ends.
- b) Critical faculties and knowledge that is applicable to situations encountered in the family (home), the community, and one's chosen occupation.

Specific Objectives: The course should enable student:
- a) To seek descriptions of phenomena encountered in every day life in terms of cause and effect.
- b) To classify information and experiences.
- c) To report observations and findings honestly and confidently.
- d) To communicate information in a clear and systematic way.
- e) To demonstrate simple agricultural, domestic and laboratory skills.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All secondary school students (ages 14-15).

Ways in which it differs from similar or previous programs: Learning is based on pupil's own activities and discussion; Teacher provides minimum of information; gives much more individual attention. No textbook is provided.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
1. Trial editions of Pupil's Manual; Pupil's Workbook Teacher's Guide for Year 2	Unknown	PSI
2. Final editions of Pupil's Manual; Pupil's Workbook Teacher's Guide for Year 1 in press	Unknown	Longmans/Sedco

PRESENT COMMERCIAL AFFILIATIONS:

Longmans/Sedco Publishing Ltd. P. O. Box 2051 Accra, Ghana

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: None

TEACHER PREPARATION:

Consultant Services: Visits to schools by the co-ordinator and evaluators. Discussions at Workshops.

Pre-service and In-service Training: Workshops for teachers before starting to teach the course. Workshops during the year for feedback and discussion. Financed by grant from S.E.P.A. (Science Education Programme for Africa).

Pre-service and In-service Teaching Materials: None

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Pertinent Research Studies: None

In-House or Unpublished Research: Materials evaluated mainly by observations of lessons by evaluators, and by feedback from teachers in workshops. These revealed that teachers often used the materials in ways which were contrary to the spirit of the course.

Availability of Evaluative Data: None

PROJECT PUBLICITY: None

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE:

Final rewriting of Year 2 in July-August 1976. Publication of Year 2 in 1977. Possible revision to fit new educational structure. Possible extension of integrated course to O-level.

KENYA PRIMARY MATHEMATICS (KPM)

Kenya Institute of Education
P.O. Box 30231
Nairobi, KENYA
Africa
Telephone: 28284, 28285, 28483

Director: G. M. Kimote
Project Duration: 1966-1977

Age: 6-12
Ability: all
Subject: math
Language: English
Translations: none
Testing of Students:
written achievement and oral tests, teacher judgments

Materials Developed by Project:

Print	Non-Print
Textbooks	None
Tchr. Manuals	

Types of Learning Experiences:
Discussion
Lab Activities

PRINCIPAL PROFESSIONAL STAFF: G. M. Kimote, Coordinator

PROJECT HISTORY:

Principal Initiator(s): Ministry of Education, Kenya

Reason(s) for Project Initiation: Development of a relevant curriculum program in mathematics.

Evolution and Development of the Project: A pilot mathematics program was started in 1966 and in 1971 the KPM which took over was started.

PROJECT OBJECTIVES:

Overall Project Purpose: Developing a full primary course in mathematics.

Specific Objectives: Developing a modern relevant mathematics program for the country at the primary level.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Elementary school students, aged 6-12, in schools of Kenya.

Ways in which it differs from similar or previous programs: Based on local issues and examples, the project adopts an inquiry and practical approach in the learning of mathematics. Many of the earlier projects were simply imported from Britain and were always irrelevant, both in content and examples.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Teachers Books, Grades 1-7	Not Given	Jomo Kenyatta Fd.
Pupils Books, Grades 1-7	Not Given	Jomo Kenyatta Fd.

PRESENT COMMERCIAL AFFILIATIONS:

Jomo Kenyatta Foundation
P.O. Box 30533
Nairobi, Kenya

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

A Source Book for Teacher Trainers.

KPM (2)

TEACHER PREPARATION:

Pre-service and In-service Training: Pre-service and in-service training of teachers and in-service training of educational administrators.

Pre-service and In-service Teaching Materials: The Fundamental Concepts in Mathematics for teachers.

PROJECT EVALUATED:

Yes X No ___ Internal ___ External Agency X

Availability of Evaluative Data: Discussion with staff.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE:

Implementation of project in the entire school system in the country; running more in-service programs.

KENYA PRIMARY SCIENCE (KPS)

Kenya Institute of Education
P.O. Box 30231
Nairobi, KENYA
Africa
Telephone: 28284, 28285, 28483

Directors: M. B. R. Savage and
F. K'opiyo

Project Duration: 1970-1977

Age: 5-11
Ability: above average
Subject: general course in science
Language: English
Translations: none
Testing of Students: written achievement, lab performance and oral tests; teacher judgments, student attitude q're

Materials Developed by Project:

Print	Non-Print
Textbooks	Models
Supplementary Books	
Activity Sheets	
Tchr. Manuals	
Eval. Materials	
Behavioral Objectives	
Overview	
Newsletter	
Charts	

Types of Learning Experiences:

- Seminar
- Lab Activities
- Field Experiences
- Demonstrations
- Simulations

PRINCIPAL PROFESSIONAL STAFF:

M. B. R. Savage and F. K'opiyo, Curriculum Specialists.

PROJECT HISTORY:

Principal Initiator(s): African Primary Science Programme (APSP)

Reason(s) for Project Initiation: To develop relevant curriculum for the country.

Evolution and Development of the Project: Evolved and developed by the institute staff in consultation with the Science Education Program for Africa.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop relevant materials for use in the teaching of science in schools in Kenya.

Specific Objectives:

1. To help children acquire or preserve certain attitudes about themselves and their relationship with their environment.
2. To help children learn certain manual and cognitive skills useful in solving problems in everyday life.
3. To help children acquire information which is necessary for solving the problems they meet in modern life.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Ways in which it differs from similar or previous programs: The teacher is the facilitator for children's learning and not merely the source of knowledge. No actual program in Kenya has been developed in quite the same manner. The science classes in the past have been primarily teacher-centered.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Teacher's Guides to the Program	approx. $6.00/book	Jomo Kenyatta Foundation
Teacher's Resource Materials	approx. $6.00/book	
Pupil's Library Series	approx. $6.00/book	

PRESENT COMMERCIAL AFFILIATIONS: Jomo Kenyatta Foundation

MATERIALS AVAILABLE FREE: none

ADDITIONAL MATERIALS BEING DEVELOPED:

1. Teacher's Supplementary Materials
2. Pupil's Library Series

TEACHER PREPARATION:

Consultant Services: Pre-service and in-service consultation provided by the personnel in the Institute and Teacher's Advisory Centers.

Pre-service and In-service Training: Pre-service and in-service workshops and seminars financed through Ministry of Education grants.

Pre-service and In-service Teaching Materials: None specifically for this. Use normal program materials. A resource book developed by the Science Education Program for Africa is extensively used.

PROJECT EVALUATED:

Yes X No ____ Internal ____ External Agency X

Pertinent Research Studies: none

PROJECT PUBLICITY: None

PROJECT ACTIVITIES SINCE 1974 REPORT: Further development of teacher and pupil materials.

PLANS FOR THE FUTURE:

More in-service and pre-service instruction for teachers and teacher trainers during the implementation stage.

UNIVERSAL PRIMARY EDUCATION TEACHER EDUCATION MATERIAL PRODUCTION PROJECT

Nigeria Educational Research Council
P. O. Box 8058
Lagos, NIGERIA
Telephone: 41593

Director: J. M. Akintola, Hafiz Wali

Project Duration: 1975-1976

Age: adult
Ability: all
Subject: biol, chem, math, phys, earth/space, soc. sci, ed tech, English, physical & health ed, arts & crafts, home economics, Arabic & Islamic studies
Language: English, Hausa, Yoruba, Igbo, Edo, Efik, Kanuri, Fulfulde
Translations: Not answered
Testing of Students: Continuous assessment

Materials Developed by Project:

Print	Non-Print
Textbooks	Slides
	Filmstrips
	Filmloops
	Films
	Overhead Trans.
	Records
	Games
	Models
	Lab Equipment

Types of Learning Experiences:

Lecture
Seminar
Independent Study
Lab Activities
Field Experiences
Demonstrations
Simulations
Televised Lessons

PRINCIPAL PROFESSIONAL STAFF:

Drawn from University Institutes and Faculties of Education Teachers Colleges and Secondary Schools.

PROJECT HISTORY:

Principal Initiator(s): Federal Ministry of Education, Lagos.

Reason(s) for Project Initiation: To develop a better and more efficient way of educating or producing teachers for the Nigeria primary schools to meet the needs of teachers quantitatively and qualitatively.

Evolution and Development of the Project: Undertaken by the Nigeria Educational Research Council, as the implementing agency.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop more and better teachers more efficiently.

Specific Objectives:

1. To provide teachers with the skills and competencies necessary to make them more effective and to assist them to develop the capacity for self renewal.
2. Thus, at the end of their training, teachers are expected to be able to draw up and use evaluative tests to show that learning was taking place in line with objectives for the course units.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Teachers in training for service at the primary schools.

Ways in which it differs from similar or previous programs: The project was a further development of the Teacher Education Curriculum. Course materials for use in Teacher Education Colleges for producing Primary School teachers are being developed for each subject covered in the teacher education syllabus. Each course unit has a list of objectives for the unit, information on the appropriate learning experiences to get across the objectives of the unit, including references for further readings, and a test and/or evaluation to ensure that learning was taking place along the lines indicated by the course objectives.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

No materials available. Project still to be completed.

UNIVERSAL PRIMARY EDUCATION TEACHER EDUCATION
MATERIALS PRODUCTION PROJECT (2)

PRESENT COMMERCIAL AFFILIATIONS:

Longman Nigeria Ltd - P.M.B. 1036, IKeya
Macmillan - P.O.Box 264, Yaba, Lagos
OUP - PMB. 5090, Ibadan
Heinemann - P.M.B. 5205, Ibadan
Thomas Nelson - P.M.B. 1036, IKeya

MATERIALS AVAILABLE FREE:

When ready, materials will be made available free to those requiring it.

ADDITIONAL MATERIALS BEING DEVELOPED:

Teachers' Guides in support of some of the subjects.

TEACHER PREPARATION:

Consultant Services:

A program of orientation for teachers using the material has been developed. The authors of the course materials and knowledgeable teacher educators would be used in the orientation programs.

Pre-service and In-service Training: A National Teachers Institute has been established to assist in updating the teachers for the new tasks.

Pre-service and In-service Teaching Materials: The materials being produced are specifically for pre-service education, but could be very easily adapted to inservice teacher education programs.

PROJECT EVALUATED:

Yes ____ No _X_ Internal ____ External Agency ____

Availability of Evaluative Data: Not yet

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORTS: Not applicable.

PLANS FOR THE FUTURE:

In-service orientation of teachers at both secondary and tertiary levels.

CORE COURSE INTEGRATED SCIENCE (CCIS)

Curriculum Revision Unit
Science Education
Institute of Education
University of Sierra Leone
P.M.B. Freetown
SIERRA LEONE

Telephone: 26574 or 23030

Director: Brian Nicholl

Project Duration: 1971-1978

Additional information, see also Clearinghouse Reports: 9

Age: 11-13
Ability: all
Subject: integrated sci.
Language: English
Translations: none
Testing of Students: written achievement tests, lab. performance tests, oral tests, teacher judgments

Materials Developed by Project:

Print	Non-Print
Activity Sheets	Models
Tchr. Manuals	Lab Equipment
Eval. Materials	
Behavioral Objectives	
Overview	

Types of Learning Experiences:

- Lecture
- Discussion
- Lab Activities
- Field Experiences
- Demonstrations
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

S. T. P. Bundu - Curriculum Development Officer
A. C. O'Brien - Curriculum Worker

PROJECT HISTORY:

Principal Initiators(s): D. R. Hill, S. T. P. Bundu, A. C. O'Brien

Reason(s) for Project Initiation: Change in Philosophy, World Bank Ed. Project.

Evolution and Development of the Project: The CCIS program was established in response to the specific needs of junior-secondary students in Sierra Leonean schools. It received its funding from the Government of Sierra Leone, IDA, ODM, CEDO, British Council and SEPA.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop an integrated science course for use in the first three years of second stage education that can be taught in an ordinary classroom with a minimum of commercially produced apparatus and materials.

Specific Objectives: Specific teaching objectives can be found within each of the units.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All students in the first three years of second stage education.

Ways in which it differs from similar or previous programs: The entire project is based on student inquiry and problem solving.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Year One and Two Materials: 1. Teachers' Book Year 1 and Year 2 2. Pupils Workbook Year 1 and Year 2	Not given	Ministry of Ed., Univ. of Sierra Leone

PRESENT COMMERCIAL AFFILIATIONS:

Institute of Education, University of Sierra Leone, P.M.B., Freetown, Sierra Leone, West Africa

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: None at present

TEACHER PREPARATION:

Consultant Services: Advisory, from Project's full time staff.

Pre-service and In-service Training: Yearly one week inservice courses to prepare teachers in the handling (effective teaching) of CCIS materials and other general principles on modern teaching of Science.

Pre-service and In-service Teaching Materials: None

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Pertinent Research Studies: None

Availability of Evaluative Data: None presently

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT:

Year One materials have undergone editing and are now ready for publication, after which they will be implemented during the 1976/77 school year. The Project Organizers have now undertaken an intensive Inservice Training Course for teachers who will be implementing the materials.

PLANS FOR THE FUTURE:

Publication of Year One materials takes place in June 1976. Project (CCIS) will be completed by 1978.

SCIENCE EDUCATION PROGRAMME FOR AFRICA (SEPA)

SEPA Secretariat
P.O. Box 9169, Airport
Accra - GHANA
West Africa

Telephone: 75707

Director: Hubert M. Dyasi

Project Duration: 1970-

Age: 6-12, teacher ed
Ability: all
Subject: chem, biol, phys, tech, envir. science
Language: English, French
Translations: Swahili
Testing of Students: teacher judgments, achievement tests

Materials Developed by Project:

Print	Non-Print
Tests	Films
Tchr. Manuals	
Resource Book	
Monographs	

Types of Learning Experiences:

- Lecture
- Discussion
- Lab Activities

PRINCIPAL PROFESSIONAL STAFF:

Barnabas Otaala, Director of the Study of the Development of Science and Mathematics Concepts in Young Children in Africa.
Allieu Kamara, Director, Resident Teacher Training Course.
Dan Claytor, Director, Materials Development for Science Teacher Training.
E. A. Yoloye, Director, Programme for the Training of Educational Evaluators.
Other Staff: Wole Falayajo, S. F. Daramola, Joyce Buchanan-Williams, Ramonus Ohuche, Ben Laing.

PROJECT HISTORY:

Principal Initiator(s): African States

Evolution and Development of the Project: The SEPA project started in 1970 as an African continuation organization to the Primary Science Program in Freetown, Sierra Leone. The SEPA Governing Representative Council, consisting of Representatives from 11 African countries, met in Kampala, Uganda in late 1970. The Secretariat was established full time in Accra, Ghana in January, 1971.

PROJECT OBJECTIVES:

Overall Project Purpose: The promotion of excellence and relevance in science education in Africa.

Specific Objectives: Materials Development for Science Teaching Project: To develop materials--a handbook, a sourcebook, and monographs for use in the training of teachers.
Programme for the Training of Educational Evaluators: To combat two major problems of educational innovations in Africa: The shortage of trained manpower for evaluation of educational projects and instruments for evaluation of educational innovation in African countries.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students and teachers of primary schools in Africa.

Ways in which it differs from similar or previous programs: The immediate programming targets are the primary schools of the participating countries of Botswana, The Gambia, Ghana, Ethiopia, Kenya, Lesotho, Liberia, Malawi, Nigeria, Sierra Leone, Tanzania, Swaziland, Uganda, and Zambia.

SEPA (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Materials Development for Science Teacher Training Project		
1. Materials Handbook (an instructional guide)	Free	SEPA
2. Sourcebook (a reference book on materials and ideas on physical and biological sciences)	Free	SEPA
3. Monographs (in-depth studies on selected science topics)	Free	SEPA

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: Single copies of materials listed above available on request while limited supplies last.

ADDITIONAL MATERIALS BEING DEVELOPED:

Materials Development for Science Teacher Training Project: Textile-base visual aids for basic and health education using textile produced by local textile companies and the silkscreen printing process.

TEACHER PREPARATION:

Pre-service and In-service Training:

1. Programme for the Training of Educational Evaluators of Educational Programmes in African Countries
2. Resident Teacher Training Course

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency X

Pertinent Research Studies:

1. Yoloye, E.A. 1970. A Study of Teacher Response to Training on APSP Materials. Journal of Science Teachers Association of Nigeria. 9(1): 21-25.
2. Duckworth, E.R. 1971. A Comparison Study for Evaluating Primary School Science in Africa. EDC. Newton, Massachusetts.
3. Balogun, T.A. 1971. Task Analysis of Some APSP Units. Mimeograph. University of Ibadan.

In-House or Unpublished Research: The International Center for Educational Evaluation, University of Ibadan, Nigeria working in cooperation with SEPA has evaluated:

1. SEPA, Elementary Science Programme
2. University of Ife 6-Year Primary Education Project, Nigeria
3. The Mid-West Elementary Science Programme in Midwestern Nigeria
4. The Namutamba Pilot Project in Uganda

PROJECT PUBLICITY:

Yoloye, E.A. Feb 1966. Trends in Elementary Science Curricula. West African Journal of Education. pp 18-21. Ibadan.

Gornall, F.A. May 1970. The African Primary Science Program. Commonwealth Education Liaison Committee Newsletter. 2(9).

Dyasi, H.M. Spring 1974. Integrated Science Education in African Primary Schools. Prospects. 4(1).

PROJECT ACTIVITIES SINCE 1974 REPORT:

1. Study of the Development of Science and Mathematics Concepts in Young Children in Africa (Uganda)
2. Seminaire sur l'enseignement scientifique de l'environnement dans les ecoles primaires (Ghana)
3. Materials Development for Science Teacher Training (Sierre Leone)

SEPA (3)

PROJECT ACTIVITIES SINCE 1974 REPORT: (Continued)

4. Programme for the Training of Educational Evaluators (Nigeria)
5. Resident Teacher Training Course (Sierre Leone)

PLANS FOR THE FUTURE: Not answered

WEST AFRICAN A-LEVEL BIOLOGY

Department of Botany
University of Ghana
Legon, Accra
GHANA

Director: J. B. Hall
D. W. Ewer

Project Duration: 1967-1977

Additional information, see also Clearinghouse Reports: 7

Age: 16, 17
Ability: all
Subject: biol
Language: English
Translations: none
Testing of Students: not answered

Materials Developed by Project:

Print	Non-Print
Textbooks Lab Books Tchr. Manuals	

Types of Learning Experiences: Not answered

PRINCIPAL PROFESSIONAL STAFF: Not answered

PROJECT HISTORY:

Principal Initiator(s): D. W. Ewer
J. B. Hall

Reason(s) for Project Initiation: To meet requirements of new syllabus with appropriate teaching material

PROJECT OBJECTIVES:

Overall Project Purpose: To provide teaching materials for new A-level syllabus with strong ecological slant.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: West African, anglophone, sixth form (age 16-17) boys and girls i.e. fairly bright intellectually, culturally mixed and probably mostly equivalent to "middle class".

Ways in which it differs from similar or previous programs: Emphasis on African ecology at sixth-form school level.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Materials	Cost	Source
Ecological Biology I, Organisms and their environments Ecological Biology, Practical Book 1 Ecological Biology, Teachers Guide 1	Not given	Longman & Co.

PRESENT COMMERCIAL AFFILIATIONS:

Longman & Co., Longman House, Burnt Mill
Harlow, Essex CM 20 2JE, U. K.

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

- Ecological Biology II, The Interrelation of Organisms
- Ecological Biology II, Practical Book II
- Ecological Biology II, Teachers' Guide II

TEACHER PREPARATION: None

PROJECT EVALUATED:

Yes _____ No __X__ Internal _____ Outside Agency _____

WEST AFRICAN A-LEVEL BIOLOGY (2)

PROJECT PUBLICITY:

Length, Breadth and Depth
J. biol. Ed. 1974.8 (3). 145

PROJECT ACTIVITY SINCE 1974 REPORT: Preparing material for press.

PLANS FOR THE FUTURE:

On completion of present books, work will start on a possible adaptation of the new African-oriented texts for use in the U. K.

VIKRAM A. SARABHAI COMMUNITY SCIENCE CENTRE (VASCSC)

Vikram A. Sarabhai Community Science Centre
Navrangpura, Gujarat State
Ahmedabad. 380009
INDIA

Telephone: 42914

Director: K. B. Shah

Project Duration: 1966-

Additional information; see also
Clearinghouse Reports: 7, 8, 9

Age: 9-18
Ability: all
Subject: bio, chem, phys, earth-space, math, ed tech
Language: English, Gujarati, Hindi
Translations: none
Testing of Students:
  interest inventories
  general program eval.

Materials Developed by Project:

Print	Non-Print
Textbooks	Overhead Trans.
Supplementary Books	Games
Tchr. Manuals	Models
Field Guides	Lab Equipment
Science Wall Newspaper	

Types of Learning Experiences:
- Lecture
- Discussion
- Lab Activities
- Field Experiences
- Demonstrations
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

Dr. K. B. Shah, Director/Collaborator-Physics
Prof. L. S. Prahlada Rao, Collaborator-Biology
Dr. C. J. Sanchorawala, Collaborator-Chemistry
Mr. R. Kothari, Audiovisual Expert
Prof. A. R. Rao, Hon. Mathematician
Mrs. J. A. Mehta, Scientist-Elementary Education

PROJECT HISTORY:

Principal Initiator(s): Dr. Vikram A. Sarabhai and K. B. Shah

Reason(s) for Project Initiation:

Though there are national problems, there are no national solutions. The motivation and commitment of those who are involved at the local level therefore become important. Local groups should experience perceptible changes so that a better future becomes credible and results in greater commitment to the initial task. It is therefore first necessary to identify institutions, teachers and students motivated enough to take positive local action. Such a group could be brought together for regular interaction on a continuing basis to (i) discuss the problems (ii) question basic assumptions and (iii) to experiment with the new ideas.

Evolution and Development of the Project:

This Centre was started as a facility where efforts for the improvement of science and mathematics education by individuals and institutions were collected and disseminated. Initially it started with programs for curriculum development, teacher training, and community education. Later, participation increased with the introduction of programs like Do-it-yourself wall exhibits, Open laboratories and workshops, demonstration-lectures etc. Starting at the secondary school level, the programs now encompass primary, secondary, college and adult levels. Stationed in an urban area, the Centre is planning to extend its activities to rural areas. The Centre has also now moved into the field of mass communication through television films and science wall newspapers. Funding for the Centre is from the Ministry of Education, Government of India through NCSE/NCERT, The Government of Gujarat, and the Nehru Foundation for Development, Ahmedabad.

PROJECT OBJECTIVES:

The Centre is dedicated to:

(i) promote among students, teachers and lay public
  (a) an understanding of fundamental concepts involved in the physical and biological sciences and mathematics;
  (b) the acquisition of scientific knowledge and insights as far as possible by the process of inquiry through experiment, audio-visual media and other means;

PROJECT OBJECTIVES: (continued)

(c) the ability to solve problems

(ii) stimulate interest; encourage the teaching of the principles of science and scientific method to elementary, secondary and college students, teachers and general public.

(iii) concern with the role of education, and ways of improving education in relation to the individual and the community as a whole.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: The Project includes programs at the primary, secondary, tertiary, and community education levels for: The City of Ahmedabad - (Population 1.6 million) for local participation; The State of Gujarat for adoption and implementation of some programs; Working model for innovations in science and mathematics education in the country.

Ways in which it differs from similar or previous programs:

(i) It is a non-profit, non-government institution set up to integrate the efforts of motivated individuals and institutions at the local level in the improvement of science education.

(ii) It is a forum for free exchange of ideas and experiences in education.

(iii) The Centre emphasizes and provides adequate facilities for the participants to prepare and produce audio-visual content material.

(iv) It has paved new paths for changing the State written syllabi. The Centre prepares new syllabi based on active thinking of practicing teachers, tries them out in a number of institutions and eventually submits final proposals to the State Government. The introduction of the new syllabi is then followed up by refresher courses for teachers, production of subsidiary reading materials, teaching aids, etc.

(v) It also provides a good model for disseminating new ideas and approaches in learning and teaching developed by national and international organizations.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
1. At the core of science is you	Not Given	VASCSC
2. Science learning through inquiry		
3. Do Observe Question - Vol. I to V		
4. Home experiments for children		
5. Introductory Physical Science		
6. Students & Environment Vol. I&II		
7. Trial Topics on Energy		
8. New Mathematics in Gujarat		
9. Refresher Course in Chemistry Part I & II		
10. Refresher Course in Mathematics		
11. Field Trip for Science Education		
12. Using AV Techniques for Science		
13. Textbook of Algebra for Std. VIII & IX(Guj.)		
14. Teachers' Guide for school Algebra Project (Guj.)		
15. High School Mathematics Project Texts Std. VIII Book I, II, III		
16. " " Std. IX - Book IV, V		
17. " " " X - Book VI, VII		
18. " " " XI - Book VIII, IX & X		
19. AV Documentation for Science learning and Science		
20. AV techniques for science learning and science		
21. Science Wall News Paper - Issues I - V (Guj.) Translations in 4 Indian Languages		
22. Outline of Petroleum Refining and Petro-chemicals		
23. Introductory Elementary mathematics for teachers and parents		
24. Science and Community (Seminar Report)		

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material	Cost	Source
25. Science for Community	Not Given	VASCSC
26. Film: How it Happens?		
27. Refresher Course in Biology		
28. Vriksha Prani Jeevan Sate (Guj.)		
29. Science Films List		
30. Teacher Orientation		
Mini Books:		
31. What is Science (Eng.& Guj.)	Free	VASCSC
32. From Seed to Plant (Guj.)	Free	
33. Molecule (Guj.)	Free	
34. Man and Space (Eng.& Guj.)	Free	
35. Energy (Guj.)	Free	
36. From egg to chick (Guj.& Hindi)	Free	
37. Elements (Guj.)	Free	
38. Tree is my friend (Guj.)	Free	
39. Tree is my life (Guj.)	Free	
40. Meet the Scientist-1970 & 1971	Not Given	VASCSC
41. Staff Orientation		
42. Biology in medicine		
43. Ajno Vignani (Guj.)		
44. Seeing Big (Eng.& Guj.)		
45. Cell: the unit of life	Free	VASCSC
46. Pollution (Guj.)	Free	
47. Nutrition (Guj.)	Not Given	VASCSC
Teaching Aids:		
48. Conductivity Apparatus	Rs. 10-00	VASCSC
49. Coupled System	Rs. 18-00	"
50. Double Cone	Rs. 14-50	"
51. Electric Kit	Rs. 30-00	"
52. Electrolysis Unit	Rs. 25-00 (without cells)	"
53. Giant Yo-Yo	Rs. 29-00	"
54. Gravity Tower	Rs. 20-00	"
55. Height Measuring Device with Graph Board	Rs. 93-00	"
56. Linear Expansion Apparatus	Rs. 10-00	"
57. Newton's Cradle	Rs. 36-00	"
58. Building Blocks	Rs. 25-00	"
59. Colourful Path	Rs. 8-00	"
60. Colour Filters	Rs. 17-00	"
61. Colour Matching Puzzle	Rs. 10-00	"
62. Cube Puzzle	Rs. 15-00	"
63. Illusion Mural	Rs. 50-00	"
64. Magic Cube (Wire Model)	Rs. 15-00	"
65. Magic Number Cube (Wooden Block)	Rs. 15-00	"
66. NIM (Marble Game)	Rs. 7-50	"
67. Moon Probe	Rs. 25-00	"
68. Parking Puzzle	Rs. 12-00	"
69. Tic-Tac-Toe	Rs. 34-00	"
70. String Bead Puzzle (Topology)	Rs. 7-50	"
71. Tower of Brahma	Rs. 11-50	"
72. Window Reader	Rs. 10-00	"

PRESENT COMMERCIAL AFFILIATIONS:

1. Dynam Engineering Corporation, No. 6 Haudin Road, Bangalore, India
2. Anada Book Depot, Near Bal Hanuman, Gandhi Road, Ahmedabad 380001 India

PRESENT COMMERCIAL AFFILIATIONS: (continued)

3. Gujarat School Textbook Board, Dafnala, Shahibag, Ahmedabad. 380004 India

MATERIALS AVAILABLE FREE: Items 31-39, 45, and 46

ADDITIONAL MATERIALS BEING DEVELOPED:

(i) Compound Microscope

(ii) Various items for mathematics laboratory, teaching aids and aids and exhibits.

TEACHER PREPARATION:

Consultant Services: Personal consultation with VASCSC staff by prior appointments.

Pre-service and In-service Training: Weekend course, short-term and long-term refresher courses, writing workshops, summer institutes etc.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Pertinent Research Studies: Raval, C. S., March, 1971. Evaluation of the outcomes of the Special Science Teaching Programs conducted by Community Science Centre - Submitted for M.Ed. Gujarat University. No evaluation of the overall activities of the Centre.

PROJECT PUBLICITY:

1. Science Resource Letter, Vol. 2 No. 1, November 1967.
2. The Asia Foundation Quarterly Report, November, 1967.
3. The British Council Science Education Newsletter No. 10, July, 1969.
4. Economics Times, January 19 and 20, 1969.
5. Science Education in Gujarat (published for participants of Gandhi Centenary International Couference on Science Education and Non-violence held in October, 1969 at Ahmedabad).
6. International Newsletter, Issue IX July 1970 (published by the Educational Testing Service, Princeton, New Jersey, U.S.A.)
7. Times of India, Weekly of Sunday December 5, 1971.
8. Physics News March 1972 page 17.

PROJECT ACTIVITIES SINCE 1974 REPORT:

1. As a result of a 3-year program on Integrated Science tried with secondary school students, publications on the Unit "Energy" were brought out. These could be used as supplementary reading material/resource books.
2. Science Learning Through Inquiry approach was tested with students in Stds. IX and X and a publication entitled Do Observe Question was brought out for the use of teachers.
3. Textbooks on mathematics for Std. XI were produced and published.
4. A Study Action Group in Elementary Education (SAGEE) was established to discuss and evolve a new primary level program. Meetings and seminars on Elementary Science Education were organized. Study of various materials at this level produced by active groups in our country and abroad was undertaken.
5. Orientation Courses in science and mathematics for Std. X were conducted.
6. Teachers guide for Std. VIII in science was produced and published.
7. Compound microscope, Teaching Aids, Playthings, Science Exhibits; a slide show on "Trees" and Science Wall News Papers were produced.
8. Exhibition on "Man and Space" was organized.
9. Published popular books on Trees for Forest Dept. of Gujarat State.
10. Community Programs like lecture demonstrations, popular science lectures on different topics and Night Sky Observation; Open House laboratory etc. were organized.

PROJECT ACTIVITIES SINCE 1974 REPORT: (continued)

11. Under the SAC/SITE national program, the VASCSC provided consultation for 21 TV films.

PLANS FOR THE FUTURE:

1. Elementary Education: A rethinking in the field of primary education in science and mathematics, could be based on the psychology of learning and development of science and mathematics concepts for children. Following this, a new curriculum in science and mathematics could be developed for the elementary level which could be tried on project basis in selected schools.
2. Evaluation Cell: On different occasions, questions have been raised regarding the evaluation of the different programs conducted by the Centre. An evaluation cell could develop a "Built-in" system for such evaluation. This cell will also take up evaluation of the impact of "Vignan Drushti" (Science Wall News Paper) in Gujarat and other States.
3. Rural Program: Small Extension Centres may be established in the rural areas for carrying out programs of science learning with students, teachers and the community. It is also proposed that the centre acquire a mobile van equipped with a good laboratory, teaching aids and audio-visual materials. This van will visit several rural areas to carry out activities such as inquiry lessons, refresher courses for teachers, lecture-demonstration, film shows etc.
4. Mathematics laboratory: It is felt that it is possible to build up a mathematics laboratory of primary, secondary and advanced levels in mathematics. Mathematics models, toys, exhibits and teaching aids could be tried and developed.
5. Science Playground: The playroom facilities developed on a trial basis seem to have created interests at various levels. Now toys could be designed and developed. It may be possible that in collaboration with other organizations, playrooms could be set up at different places in and around the city. The playground idea has now to be developed.

DEVELOPMENT SCHOOL PROJECT (PROYEK PERINTIS SEKOLAH PEMBANGUNAN (PPSP))

Curriculum Development Centre
Office of Educational and Cultural
Research and Development
Jalan Gatot Subroto 41
Jakarta, INDONESIA

Telephone: Not given

Director: Mr. Soedijarto

Project Duration: 1971-

Age: 6-18
Ability: all
Subject: biol, chem, phys, earth-space, math, soc. sci, language, cultural arts, practical arts, physical education, religious educ.
Language: Indonesian
Translations: some English
Testing of Students: written achievement tests, teacher judgments, student attitude questionnaire

Materials Developed by Project:

Print	Non-Print
Programmed Units	Audiotape
Activity Sheets	Lab Equipment
Tchr. Manuals	
Eval. Materials	
Behavioral Objectives	
Overview	

Types of Learning Experiences:

Independent Study
Lab Activities
Field Experiences
Discussion

PRINCIPAL PROFESSIONAL STAFF:

Ratna Wilis Dahar, Chairman of Science Group
A. Kodir, Chairman of Mathematics Group

PROJECT HISTORY:

Principal Initiator(s): Minister of Education and Culture

Reason(s) for Project Initiation: Need to improve effectiveness, efficiency and relevance of the Indonesian School System.

Evolution and Development of the Project:
Phase 1 started in January 1972 during which eight Colleges of Education carried out studies of the needs of local society and tried out new curricular material in nearby schools. A National Survey of Educational Objectives was carried out simultaneously by the Curriculum Development Centre. This involved discussions with leading members of all aspects of Indonesian society.

Phase 2 commenced in July 1973 when a Master Design for the project was prepared using the experience gained in phase 1. The Master Design included initially: Mathematics, Science, Language and Social Studies. Recently Basic Course Outlines have been completed for Practical Arts, Cultural Arts, Physical Education and Religious Education. Curriculum material was prepared for classes 1, 4, 6 and 9 in 1976 and trials commenced in January 1975 at one school associated with each College of Education. Trials now extend to years 2, 5, 7 and 10.

Work is now being done to prepare special courses for years 6, 9 and 12 to prepare students for employment and for year 12 for students continuing their education at the tertiary level.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop a system of elementary and secondary education that is: a) Effective and relevant to the individual and societal needs as reflected in educational programs offered; b) A basis for life long education; and c) Efficient, realistic and consistent with the resources and capabilities of the Indonesian government, society, and people.

Specific Objectives: 1) To develop student centered courses in all subject areas for all age levels; 2) To develop courses at school level relevant for those proceeding to employment in rural as well as urban areas and also for those con-

PROJECT OBJECTIVES: (Continued)

Specific Objectives: (continued)

tinuing studies in colleges and universities; 3) To develop courses and a management system which are sufficiently flexible to cater to students of all interests, needs and potentials; 4) To develop courses that are sensitive to the environment of the individual and enhance national spirit and identity; 5) To develop effective means of delivering the courses, to include improved buildings, facilities, material, and teacher education; 6) To develop a comprehensive and continuous evaluation system of students and courses so that weaknesses can be corrected and strengths exploited; and, 7) To develop guidance and counselling procedures so that each student can be assisted to derive the greatest benefit from the educational opportunities available.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Materials produced for Science and Mathematics: Costs not given Source: PPSP

Master Design
Operational Design
The Strategy for Developing the Development School Curriculum
The Development School Curriculum Structure
Basic Course Outline of Science
Basic Course Outline of Mathematics
Basic Course Outline of Skill Developments
Manual - How to Write a Module
Teacher Training Module - Manual for the Instructors on Modular Instruction System
Teacher Training Module - Modular Instruction System
Teacher Training Module - Teacher Role in Modular Instruction System
Teacher Training Module - How to make the readings easy to be read
Teacher Training Module - An Enrichment - The Role of Guidance and Counseling in Modular Instruction System
Teacher Training Module - How to Create Enrichment Activities
Teacher Training Module - How to Make and Use the Test
Teacher Training Module - The Use of Check List and Scales in Evaluation
Teacher Training Module - How to Evaluate a Module
Teachers Guide on Modular Instruction in the Development School
School Administration in the Development School - The Concept and the Use of Cluster System
Series of Modules on Science for 1st, 4th, 6th, 9th grades
Series of Modules on Mathematics for 1st, 4th, 6th, 9th grades
Series of Modules on Social Studies for 1st, 4th, 6th, 9th grades
Teaching Material for Modular Writers Training

PRESENT COMMERCIAL AFFILIATIONS:

None. Publication is likely to be by the Department of Education and Culture.

MATERIALS AVAILABLE FREE:

Description of Project in English.
Material in Indonesian available to established Curriculum Centres.
Translations in English may be available in 1977.

ADDITIONAL MATERIALS BEING DEVELOPED:

Equipment, further modules, audio tapes.

TEACHER PREPARATION:

Consultant Services: In the Development Schools, consultants are always available from the associated College of Education. When the project material is tried in a wider range of schools (tentatively from 1977) consultants will be available, but on a less immediate scale.

TEACHER PREPARATION: (Continued)

Pre-service and In-service Training: Special Modules have been produced for in-service teacher training. These include modules on the trial system and also short modules for use in micro teaching with mini courses. Such modules are available for Social Studies, Science and Mathematics. These modules deliberately introduce a number of teaching situations, (such as more than one valid answer to an enquiry) with which the teachers are not familiar. The preparation of pre-service courses is at an early planning stage. Budget for in-service courses is about $25,000 per annum.

Pre-service and In-service Teaching Materials: Materials available at no charge for in-service courses conducted by the project.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency X

Name of Outside Evaluators: International Institute for Educational Planning, 7-9 Rue Eugene Delacroix, 75016 Paris. Dr. T. Neville Postlethwaite is the responsible person for the external evaluation.

Pertinent Research Studies: None

In-House or Unpublished Research: Analysis of student achievement tests for most modules;special emphasis on class 6 science.

Availability of Evaluative Data: No

PROJECT PUBLICITY:

At the development stage publicity has been minimal. A full account is to be published by the International Institute for Educational Planning, in association with a Seminar on Teaching-Learning Strategies and Educational Planning.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE:

Five writing conferences are held each year. There are two large Review meetings each year. Trials will commence for Practical Arts, Cultural Arts, Physical Education, Religious Education in January 1977. Extended trials to assess the validity of the curricular material in typical schools are planned for 1977.

AGRICULTURE AS ENVIRONMENTAL SCIENCE PROJECT (AES)

Curriculum Center
Ministry of Education and Culture
7 Paran Street
Jerusalem
ISRAEL

Telephone: 02-817251

Director: A. Blum

Project Duration: 1966-

Additional information, see also
Clearinghouse Reports: 9,8,7

Age: 11-17
Ability: all
Subject: agriculture, envir. sci, biol, soc. sci, eng/tech
Language: Hebrew
Translations: English, Arabic
Testing of Students: written achievement tests, teacher judgments, student attitude q're, interest inventories

Materials Developed by Project:

Print	Non-Print
Textbooks	Slides
Lab Books	Filmloops
Supplementary Books	Games
Activity Sheets	Lab Equipment
Tchr. Manuals	
Field Guides	
Eval. Materials	
Behavioral Objectives	
Overview	
Newsletters	
Charts	
Catalogue of Materials	
Blue Print for Land Laboratory	

Types of Learning Experiences:

Lecture
Discussion
Independent Study
Lab Activities
Field Experiences
Demonstrations
Simulations
Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

A. Blum, Director
B. Feinstein, Team Leader
A. Halevy, Chief Scientific Advisor

PROJECT HISTORY:

Principal Initiator(s): Ministry of Education and Culture, A. Blum

Reason(s) for Project Initiation: Change in philosophy and need for new course.

PROJECT OBJECTIVES:

Overall Project Purpose: Innovation in curricula and in teaching methods; keeping up with the developments of modern science and agriculture; developing an integrated teaching approach.

Specific Objectives: To stimulate an experimental approach to problem solving; to develop the ability to use different sources and forms of information; to develop positive attitudes toward agriculture, plant growing and animal raising.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: The materials are suitable for heterogeneous classes of medium level students aged 11-17 and include suggestions for more advanced students. Special programs of more prevocational character were developed for early school leavers.

Ways in which it differs from similar or previous programs: Agriculture is seen as applied biology and as the endeavor of man to manipulate his environment (under certain restrictions) to suit his needs. Theory, field experiments and laboratory investigations are interwoven. Relevant agricultural and environmental issues are used to let students discover how to analyze "real life" problems and how to come to a decision about what to do about them. The biological aspects are stressed, but agrotechnical, cultural, economic and other social science elements are introduced where needed. The tendency is towards integration

UNIQUE CHARACTERISTICS OF THE PROJECT: (Continued)

Ways in which it differs from similar or previous programs: (continued)

of these elements.

Science is conceived as one of man's intellectual activities and as part of a wider, cultural complex. Therefore items on socio-cultural issues are included in the basic materials. Special additions were developed for Arabic and Jewish religious schools.

Since most students live in towns, flowers and pot plants, which can be grown at home, were preferred in "Let's Grow Plants" and in "Plants in your Home". For the same reason consumer problems like pesticide residues and biological control are raised in "Let's Protect Plants".

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
For Grade 6:		
Seeds Germinate-Student Text & Teacher Guide in Hebrew	Not Given	Maalot
Plants in Your Home-Student Text in Arabic and Hebrew; Teacher Guide in Hebrew	Not Given	Maalot/Arab Pub.
The Voice of the Turtle-Dove is Heard in Our Land - Student Workbook and Teacher Guide	Free	AES
For Grade 7:		
Let's Grow Plants-Student Text in Arabic and Hebrew; Teacher Guide in Hebrew	Not Given	Maalot/Arab Pub.
Teachers Magazine - Background materials to Let's Grow Plants	Free	AES
Catalogue of Materials and Equipment needed for Let's Grow Plants and Seeds Germinate	Free	AES
Blueprints for the Planning of Land Laboratories, mainly for Let's Grow Plants	Free	AES
For Grades 8-9 (Let's Protect Plants Series):		
The Fruit Fly and the DDT Problem-Student Text in Arabic and Hebrew	Not Given	Maalot/Arab Pub.
Uncalled-For Guests (Weeds and their Control) - Student Text in Arabic and Hebrew	Not Given	Maalot/Arab Pub.
Definer for Weed Seedlings in Hebrew	Not Given	Maalot
Series of Six Slides to Uncalled-For Guests	Not Given	Machon leemzae horaa
On Moulds and Mildews (and other fungi) - Student Text in Arabic and Hebrew	Not Given	Maalot/Arab Pub,
Life Cycle of Fungi - A Board Game (in Hebrew)	Not Given	Maalot
Teacher Guide to Let's Protect Plants Series	Not Given	Maalot
Teachers Magazine - Background materials to Let's Protect Plants Series	Free	AES
Catalogue of Materials and Equipment needed for Let's Protect Plants Series	Free	AES
For Grades 8-9 (Other Topics)		
The Fight Against Hunger - Student Text and Work-cards in Arabic and Hebrew	Not Given	Maalot/Arab Pub.
Series of Chapters for Reading - to go with The Fight Against Hunger (in Arabic and Hebrew)	Not Given	Maalot/Arab Pub.
End to Hunger - A Simulation Game (in Hebrew)	Not Given	Maalot
Teacher Guide to The Fight Against Hunger(in Hebrew)	Not Given	Maalot
Let's Grow Bees - Student Text in Arabic and Hebrew	Not Given	Maalot/Arab Pub.
Worksheet for approximation of bee brood area in Hebrew	Not Given	Maalot

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (Continued)

Material	Cost	Source
For grades 8-9 (Other Topics): (continued)		
Teacher Guide to Let's Grow Bees in Hebrew	Not Given	Maalot
How to Get Dressed - Filmloop to Let's Grow Bees	On Loan	AES
How to Open a Hive - Filmloop to Let's Grow Bees	On Loan	AES
Treatment of American Foulbrood - Filmloop to Let's Grow Bees	On Loan	AES
Prevention of American Foulbrood - Filmloop to Let's Grow Bees	On Loan	AES
Let's Grow Chicks - Student Text in Arabic and Hebrew	Not Given	Maalot/Arab Pub.
Series of 12 Slides to Let's Grow Chicks	Not Given	Machon leemzae horaa
Teacher Guide to Let's Grow Chicks in Hebrew	Not Given	Maalot
Development of the Human Embryo - Reader to Let's Grow Chicks (in Hebrew)	Not Given	Maalot
For Grades 10-11:		
Plant Growth Regulators - Student Text and Teacher Guide in Hebrew	Not Given	Maalot
Materials in English:		
Let's Grow Plants - A Description of the Project	Free	AES
Excerpts from Let's Grow Plants	Free	AES
Excerpts from Teacher's Guide to Let's Grow Plants	Free	AES
Excerpts from Let's Protect Plants Series	Free	AES

PRESENT COMMERCIAL AFFILIATIONS:

Hebrew: Maalot, Israel Publishers' Association, 29 Carlebach Road, Tel Aviv
Arabic: Arab Publishing House, 17a Hagra Road, Tel Aviv
Slides: Machon leemzae horaa, 26 Mohilever Road, Tel Aviv

MATERIALS AVAILABLE FREE: See Materials Already Produced, above.

ADDITIONAL MATERIALS BEING DEVELOPED:

Readers to The Voice of the Turtle-Dove is Heard in Our Land
Teacher Guide to Let's Grow Bees
The Ever-Flowering Plot (Grade 6)
Materials for Rural and Agricultural High Schools

TEACHER PREPARATION:

Consultant Services: Visits to schools by project staff and by supervisors; regional meetings with teachers using the materials.

Pre-service and In-service Training: Summer institutes are held for teachers, who use the project materials for the first time (2-3 weeks) and for those who already have experience with it. Shorter courses are held for in-service teachers during school vacations. AES courses are part of teacher training at the Hebrew University (Agric. Educ) and teacher seminars.

Pre-service and In-service Teaching Materials: Teacher training institutions receive trial materials of new courses, which are under development. Teachers' magazines are used in teacher pre- and in-service training.

PROJECT EVALUATED:

Yes X No _____ Internal X External Agency _____

Pertinent Research Studies:

Blum, A. Students' attitudes towards a school subject as affected by curriculum reform. Proc. International Symposium on Evaluation on Science Teaching, Jerusalem. 1972.

PROJECT EVALUATED: (Continued)

Pertinent Research Studies: (continued)
Blum, A. A study on the influence of an inquiry method in teaching 7th grade agriculture on students' achievements towards agriculture; Ph.D. thesis, Hebrew University of Jerusalem, 1975.

Availability of Evaluative Data: Write to director for tests and evaluation reports.

PROJECT PUBLICITY:

M. Araf, "Chapters in Agriculture," Zada el-Tarbyeh, Vol. 17, No. 13, May 1969.

E. Breeze, "Let's Grow Plants", Book Review, The School Science Review, Vol. 51, No. 177, June 1970.

A. Blum, "A Pragmatic Approach to Science Education - Agriculture as Rural Science", Junior Science Conference, Final Report, Rehovot, 1969.

A. Blum, "Science Teaching in Developing Society: Some Psycho-Social Determinants", New Trends in Integrated Science Teaching, Vol. I, UNESCO, Paris, 1971.

G. S. (Shiloni), "Agricultural Studies in Elementary Schools", Haklauth be' Israel, Vol. 16, No. 6, March 1971.

A. Blum, "The new agriculture curriculum in middle school", in (S. Eden, Ed.) On the New Curricula, Maalot, Tel Aviv, 1971.

A. Blum, "Towards a Rationale for Integrated Science Teaching", in (P. Richmond, Ed.) New Trends in Integrated Science Teaching, Vol. II, UNESCO, Paris, 1973, pp. 29-51.

"Let's Grow Plants" in (P. Richmond, Ed.) New Trends in Integrated Science Teaching, Vol. II, UNESCO, Paris, 1973, pp. 203-211.

A. Blum, "Issues in Environmental Education", Proc. International Conference on Environmental Education, Jerusalem 1975.

A. Blum, "Studies on the use of animals of economic importance in schools", Journal of Biological Education, 1976.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Revision and commercial publications of the 8-9th Grade course.
Trial and revision of materials for 6th grade and 10th grade.
Development of audiovisuals.
Revised commercial edition of 7th grade; summative evaluation.

PLANS FOR THE FUTURE:

Revised (commercial) edition of materials which are still in the try-out stage.
Development of course in Production Ecology.

EXPERIMENTAL PHYSICS PROGRAM FOR SECONDARY SCHOOLS (REHOVOT PHYSICS GROUP)

Physics Group
Department of Science Teaching
Weizmann Institute of Science
Rehovot, ISRAEL

Telephone: (03) 951-721 ext. 2981

Director: H. Harari

Project Duration: 1963 -

Additional information, see also
Clearinghouse Reports: 9, 8, 6

Age: 14-18
Ability: average, above average
Subject: phys
Language: Hebrew
Translations: Arabic
Testing of Students:
- written achievement tests
- lab performance tests
- oral tests
- teacher judgments

Materials Developed by Project:

Print	Non-Print
Textbooks	Lab Equipment
Lab Books	
Tchr. Manuals	
Eval. Materials	
Tchr. Journal	

Types of Learning Experiences:
- Lecture
- Lab Activities
- Demonstrations
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

H. Harari, Head of the Physics Group
H. Goldring, coordinator
M. Ben Zuk
R. Cohen
Z. Geller
I. Klein
H. Korati
D. Singer

PROJECT HISTORY:

Principal Initiator(s): Committee for the Promotion of the Teaching of Physics in Secondary Schools, originally part of the Committee set up by the Ministry of Education under the chairmanship of the late Amos de-Shalit.

Reason(s) for Project Initiation: To bring physics teaching up to date and improve the quality of physics teaching.

Evolution and Development of the Project: The project was originally started for grades 9-12 in the four-year high school existing in Israel, where students come with no previous knowledge of physics. In the meantime the school structure is undergoing changes - there is the 6-year high school (grades 7-9 junior high, and grades 10-12 senior high), and students start studying Physical Science in grade 7. This necessitates revision of the program.

PROJECT OBJECTIVES:

Overall Project Purpose: To introduce modern curricula and teaching methods into Israeli high schools.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Teaching of Physics in Israeli High Schools in their present and future reformed structure. Final target population is entire population in Israeli high schools and related schools (ages 13-18). Present emphasis is on the science-oriented streams in urban, rural and Kibbutz schools. Preliminary work has started on the teaching of Physics to humanities-oriented classes in these schools and also in trade and technical schools.

ROHOVOT PHYSICS GROUP (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Introduction to Physics for Grade 9, Experimental Edition I	discontinued	
Introduction to Physics for Grade 9, Experimental Edition II	discontinued	
Materials and Their Properties (Grade 9) - Commercial Edition of 1, 2 revised as a result of experience gained by the experimental editions	7.40 Israeli Lira	Rechgold
Teacher's Guide for Materials and Their Properties	2. Israeli Lira	Weizmann Inst.
Introduction to Physics for Grade 10. Experimental Edition.		Weizmann Inst.
Teacher's Guide for Introduction to Physics for Grade 10.		Weizmann Inst.
Apparatus and Laboratory Kits for use with above.	$5452.	Or-va-kol
Introduction to Mechanics (for science-oriented classes) Grade 11	discontinued	
Introduction to Mechanics for science-oriented classes, Grade 11	6.50 Israeli Lira	Weizmann Inst.
Motion and Its Causes (the foundation of Newtonian mechanics, for humanities-oriented classes) Grade 11.	3. Israeli Lira	Weizmann Inst.
Electricity and Energy for Grade 9 (junior high) Experimental Edition	discontinued	
Teacher's Guide for Electricity and Energy Experimental Edition	discontinued	
Electricity and Energy for Grade 9 (junior high) commercial edition of 11, revised as a result of experience gained by the experimental edition	14.35 Israeli Lira	Ma'alot
Electricity and Energy - Student's Workbook Commercial Edition		Ma'alot
Electricity and Energy - Teacher's Guide 2nd Experimental Edition	15. Israeli Lira	Weizmann Inst.
Light and Waves for Grade 10 (6-year high school)	10. Israeli Lira	Weizmann Inst.
Introductory Mechanics for Grade 10 (6-year high school)	5. Israeli Lira	Weizmann Inst.
Experiments in Physics for High Schools, Grades 9-12, Teacher's Handbook, experimental edition	10. Israeli Lira	Weizmann Inst.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material	Cost	Source
Introductory Modern Physics, Parts I, II for Grade 12 (science-oriented classes).	7. Israeli Lira	Weizmann Inst.
Advanced Electricity and Electromagnetism for Grade 12 (science-oriented classes).	7. Israeli Lira	Weizmann Inst.
Teacher's Journal "Gilyonot" - three times a year, Volumes 1-4 have appeared, Vol. 5, No. 1 now in preparation.	18. Israeli Lira	Weizmann Inst.

PRESENT COMMERCIAL AFFILIATIONS:

David Rechgold
87 Rothschild Blvd.
Tel-Aviv, Israel

Or-va-kol
40 Ibn Gvirol
Tel-Aviv, Israel

Ma'alot
29 Karlibach Street
Tel-Aviv, Israel

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

Teacher's Guide for "Light Waves"
Teacher's Guide for Introductory Mechanics
The Use of the Oscilloscope and AC current

TEACHER PREPARATION:

Consultant Services: Consultant services available for teachers using the materials: Staff at the Department of Science Teaching, Weizmann Institute.

Pre-service and In-service Training: In-service courses at Rehovot; lectures on selected topics in Physics; courses during summer vacation for teachers and laboratory assistants, financed by The Ministry of Education and Weizmann Institute of Science. (costs not available) Sample lessons.

PROJECT EVALUATED:

The program "Electricity and Energy" is now being evaluated.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT:

Development of books for Grade 9 Junior High, and Grades 10-12 of 6-year High School.

PLANS FOR THE FUTURE:

Planning of new textbooks in line with Senior High School reform.
Development of film-loops.
Writing of supplementary books.

ISRAEL ELEMENTARY SCHOOL SCIENCE PROJECT (MATAL)

Tel Aviv University School of Education
Sharett Building, Room 421
Ramat Aviv
Tel Aviv
ISRAEL

Telephone: 416111

Director: David Chen

Project Duration: 1966-

Additional information, see also
Clearinghouse Reports: 9, 8

Age: 5-11
Ability: all
Subject: biol, chem, phys, earth-space
Language: Hebrew, Arabic
Translations: English (in progress)
Testing of Students: teacher judgments

Materials Developed by Project:

Print	Non-Print
Textbooks	Games
Lab Books	Models
Supplementary Books	Lab Equipment
Activity Sheets	
Tchr. Manuals	
Field Guides	
Overview	
Newsletters	

Types of Learning Experiences:

Discussion
Independent Study
Lab Activities
Field Experiences
Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Professor David Chen, Director
Dr. Ruth Stavy, Head of Physical Science Team
Dr. Miriam Halpen, Head of Life Science Team
Dina Stachel, Head of Kindergarten Team
Ruth Zuzovsky, Head of Education Team
Dr. Sidney Strauss, Psychologist

PROJECT HISTORY:

Reason(s) for Project Initiation: The project was initiated to update the level of science teaching in elementary schools both in content and in method.

Evolution and Development of the Project: The project began with a limited staff and budget and several trial classes. The staff has constantly grown during its eight years and the project has been implemented in 700 schools and kindergartens.

PROJECT OBJECTIVES:

Overall Project Purpose: The students will accumulate basic knowledge in the sciences appropriate to their stage of development. They will acquire experience in the mastery of mental processes such as identification, classification, association, etc. and will acquire a mastery of the following research skills: ability to make observations, ability to ask questions, ability to plan experiments, interpret data, report results, etc. The project combines concept-oriented elementary science teaching with behavior-oriented approaches. The more specific objective of the project is to set up a science curriculum for kindergarten and elementary school.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: The project is aimed at an extremely diverse population of elementary school children ages 5-11 with a large number of culturally deprived students.

Ways in which it differs from similar or previous programs: MATAL relies on a number of foreign projects as sources of ideas. Emphasis is placed on the development of low cost equipment kits for individual manipulation by students. Experiments are in progress to study the feasibility of using audio-tutorial approaches to augment the program as well as further individualization of the program. A series of 20 teacher-training films is being produced.

MATAL (2)

UNIQUE CHARACTERISTICS OF THE PROJECT: (Continued)

Ways in which it differs from similar or previous programs: (continued)

Although the teaching units are produced with the child's developmental stage in mind, the project has found it necessary to delve deeper into the development of children's thinking processes. Intensive research is being conducted with the objectives of: (1) matching materials to children's thinking ability and 2) furthering children's thinking potential.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Teaching Units (Teachers Guide and Student Worksheets): Experimental Commercial Editions: Living Organisms and their environment, Man and His Health, Hamsters and Mice, Solutions. Experimental Editions: Kindergarten: Observing; The Senses; Curves and Shapes; Classification. Other Levels: Materials, Objects and their Properties; Life Cycles (From Seed to Seed); Magnets; Electrical Circuits; Systems and Models; Plant and Animal Behavior; Light and Shadows; About Salts and Solutions.	Not Given	MATAL
Teacher Training Films: Two Lessons - Comparison Thinking and Learning - The Meaning of Development Look at That! - Exploratory Ants I Want to Know! - Research and Discovery of Ant Activity I Have Made Light - Electrical Circuit	Not Given	MATAL

PRESENT COMMERCIAL AFFILIATIONS:

Publisher: Gestlit
Distributors: Each year distributors for equipment are chosen. For information about those chosen for 1976 - 1977 write: Department of Equipment Services, Ministry of Education, Shivtay Israel Street, Jerusalem, Israel.

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

Earth, Stones, Water, Ourselves, I and My Body, Heat and Temperature, Mechanics, Snails, Silkworm, "Sound of the Dove is Heard in Our Land", Our Aquarium. For all the units mentioned, a teachers guide and childrens worksheets are being developed.

TEACHER PREPARATION:

Consultant Services: Teachers trained by the project staff also serve as consultants to teachers in the field, visiting classes, giving technical and methodological aid, and conducting small group "help sessions". A series of educational television films has been experimented with as a method of teacher training.

Pre-service and In-service Training: The project conducts an intensive in-service training (450 hours) for groups of teachers, consisting of subject matter, methodology, developmental psychology and the teaching units. (Presently over 100 teachers have participated in these programs). These teachers in turn, participate in the training of teachers all over the country. (Field courses are directed by the Science Superintendents).

Pre-service and In-service Teaching Materials: The project has not developed as yet pre-service or in-service teaching materials for science educators.

MATAL (3)

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Pertinent Research Studies:

The Development of Concepts of Ratio and Proportion (Ruth Stavy, Sidney Strauss and Nathan Orpaz). Submitted to "Developmental Psychology".

Combining Observation and Interview in a Formative Evaluation System. (Ruth Zuzovsky, Nathan Orpaz). Submitted to "Studies in Educational Evaluation".

In-House or Unpbulished Research: The main emphasis of evaluation is for formative purposes done internally by the Evaluation Team, and can be described as consisting of three consecutive stages:

1. During the planning stage: Reflective evaluation examining the rationale, objectives, and planned activities of the planned instructional units.
2. Three evaluation stages during the tryout of the materials.
   a. Curriculum writers classes in which a single teacher instructs prototype units with close cooperation of the curriculum writers.
   b. Intensive evaluation in a small sample of classes representing students of different socioeconomic background.
   c. Formal evaluation in a representative sample of the target population.
3. Evaluation of the implementation stage: This evaluation stage is planned to provide information about the dissemination of the materials about support conditions and teacher training activities, and to coordinate this information with data about the achievement of students.

Availability of Evaluative Data: Sets of evaluation instruments: Classroom observation forms, teachers attitude questionnaires, teacher's opinion questionnaires, achievement tests and evaluation training materials for teachers are available in Hebrew at Project Headquarters.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT:

The project has continued its development of teaching units and its teacher training program. It has put more emphasis on various stages of evaluation and implementation has been expanded.

PLANS FOR THE FUTURE: Not answered

ISRAEL HIGH SCHOOL BIOLOGY (IHBP)

Israel Science Teaching Center
Hebrew University
Jerusalem
ISRAEL

Telephone: Not given

Director: Pinchas Tamir

Project Duration: 1964-

Additional information, see also Clearinghouse Reports: 9,8,7,6 and the 20-Year Cumulative Directory for title change.

Age: 14-17
Ability: all
Subject: biol
Language: Hebrew
Translations: English
Testing of Students: written achievement, lab performance and oral tests; teacher judgments, student attitude q're and interest inventories

Materials Developed by Project:

Print	Non-Print
Textbooks	Filmloops
Lab Books	Films
Tchr. Manuals	
Field Guides	
Eval. Materials	
Newsletters	

Types of Learning Experiences:
Lecture
Discussion
Lab Activities
Field Experiences
Televised Lessons

PRINCIPAL PROFESSIONAL STAFF:

A. Poljakoff-Mayber, Head of Israel Science Teaching Center
E. Jungwirth, Evaluation
A. Amir, Curriculum Development and Supervision
T. Oryan, Newsletter
E. Fuechtwanger, Supply Center

PROJECT HISTORY:

Principal Initiator(s): A. Poljakoff-Mayber

Reason(s) for Project Initiation: Need to upgrade and update the teaching of biology.

Evolution and Development of the Project:

1. 1964-1970 - Adaptation of BSCS
2. 1970-1976 - Modifying BSCS (designing original modules, lab exercises and tests)
3. 1965 - 12 classes, 300 students
4. 1970 - 500 classes, 13000 students
5. 1975 - 2000 classes, 50000 students
6. It is now the principal high school biology curriculum in Israel

PROJECT OBJECTIVES:

Overall Project Purpose: To introduce modern curriculum in biology. To upgrade teaching of high school biology. To upgrade the preparation of teachers of high school biology.

Specific Objectives: The project objectives have been to: 1) adapt, develop and implement inquiry oriented curriculum in biology based on laboratory and field investigations; 2) de-emphasize the learning of specific facts in favor of principles and skills; 3) develop new materials (texts, films, etc.) specially adapted to the local, cultural and social needs of Israel; 4) use educational technology and a multi-media approach to foster flexible and more individualized learning experiences; 5) educate teachers in light of the object stated above by pre-service and in-service training as well as by designing special teachers guides; 6) provide supplies and materials as required by the new curriculum; and 7) evaluate antecendents, transactions and achievements.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: A high school level biology course for average and above average students. A parallel course for slow learners. A parallel course for students in agricultural and kibbutz schools.

Ways in which it differs from similar or previous programs:

1. Adaptation which served as a basis for new original materials;
2. An ongoing project, responsible for preparation of materials, supplies, teacher training, evaluation, research, Teachers Bulletin;
3. Maintains full cooperation and coordination with elementary and intermediate science projects and the rest of the educational system;
4. Voluntary adoption in a centrally directed educational system; and
5. Responsible for externally administered matriculation exams.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

The materials listed below are available from the Israel Science Teaching Center, Hebrew University, Jerusalem. The cost of the materials was not given.

Investigations with Meal Worms
Open-ended Laboratory Investigations in Biology
Paper and Pencil Matriculation Exams
Biology - Inquiry into Life (Yellow): 1) Unity, 2nd Edition, Revised; 2) Diversity (Microorganisms, Plants, Animals); 3) Continuity (Heredity, Ecology, Evolution Behavior).
Patterns and Processes: 1) Ecology I, plus Teacher's Guide; 2) Cell Energetics II, plus Teacher's Guide; 3) Reproduction and Development III, plus Teacher's Guide; 4) Genetics and Evaluation IV and V, combined, plus Teacher's Guide (in preparation).
Interaction of Experiments and Ideas
Evaluation in the Biological Sciences
Lexicon of Biological Terms
Quantitative Biology
Invitations to Inquiry
Collection of Examination Questions for Yellow Version, Two Volumes
The Eye--Learning Through Experiments
Knowing Nature and Ecology
Catalog of Films and Filmloops (with description and suggestions for classroom use)
Original Film-loops (8mm regular): Osmosis, Thin Layer Chromatography, Electrons, The Snail, Dung Beetle, Sheep (Lambing, "Love Story", Time of Lambing), Mole (Mole Hunting, Mole's Nest), Eye (Part 1 and 2), Electron Microscope, Electrolysis, Body Language, The Arch, Snakes.
Original Film-loops (Super 8): Coral Reef, The Eye (Part 1 and 2).
16mm Films: The Locust, Sea Rhythms, Goats, Wildlife in the Red Sea.
Overhead Transparencies: Series of Invitations to Inquiry.

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

A commercial edition of 54 lab investigations in English will be available when a publisher is found.

TEACHER PREPARATION:

Consultant Services: 1) Pre-service courses at the university use the project's materials; 2) In-service courses are conducted weekly during the academic year and longer courses in the summer vacation; 3) Locally organized teachers groups work under the project's supervision; and 4) Occasional visits of staff in schools especially by teachers' request.

TEACHER PREPARATION: (Continued)

Pre-service and In-service Training: Teacher training has been financed by the Department of Teacher Training of the Ministry of Education. Participating teachers do not receive any pay for their participation.

Pre-service and In-service Teaching Materials: Adapted materials of STEP (England); Locally designed materials of ISTEP; Open-ended Lab Investigations.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Pertinent Research Studies:

1. Tamir, P. and Jungwirth, E. Students' Growth As a Result of Studying BSCS Biology for Several Years. Journal of Research in Science Teaching 12, 263-279, 1975.
2. Tamir, P. The Israel High School Biology - A Case Study of An Adaptation Project, Curriculum Theory Network, 1976, in press.

(Note: Most other references are included in these two publications)

In-House or Unpublished Research: Summaries of results of matriculation exams. The effect of the project on the development of laboratories in schools. Classroom interaction analysis of high school biology teachers in Israel.

Availability of Evaluative Data: Write to: Dr. P. Tamir, Director, Israel High School Biology Project, Hebrew University, Jerusalem, Israel or Prof. E. Jungwirth, Head, Agricultural Education, Faculty of Agriculture, Rehovot, P.O.B. 12, Israel.

PROJECT PUBLICITY:

See the two publications listed as research studies, above. The bibliography which accompanies these two publications is rather complete. Hebrew readers may find more publications, especially in the Biology Teachers Bulletin.

PROJECT ACTIVITIES SINCE 1974 REPORT:

1. Revision of Diversity
2. Designing 20 new open-ended lab investigations
3. Conducting 15 one-week in-service courses and 60 one-day in-service courses
4. Producing new materials for the teaching of statistics and for nature field work
5. Evaluation studies of cognitive preferences, slow learners, classroom interaction.

PLANS FOR THE FUTURE:

1. Trial version of new Diversity - 1977
2. Trial version of new Slow Learners Course - 1976
3. New units in biology for agricultural schools - 1976
4. Field Work Guides - 1976, 1977
5. Meal Worm Investigations - 1976

ISRAEL SCIENCE TEACHER EDUCATION PROJECT (ISTEP (HEMED))

Israel Science Teaching Center
Hebrew University
Jerusalem, ISRAEL

Telephone: 02-60442

Director: Pinchas Tamir

Project Duration: 1974 -

Age: adult
Ability: all
Subject: biol, chem, phys, earth-space
Language: Hebrew
Translations: none
Testing of Students: not answered

Materials Developed by Project:

Print	Non-Print
Activity Sheets	none
Tchr. Manuals	
Newsletters	

Types of Learning Experiences:

Lecture
Seminar
Discussion
Independent Study
Lab Activities
Field Experiences
Demonstrations
Simulations

PRINCIPAL PROFESSIONAL STAFF:

Pinchas Tamir, Director
Talmona Orian, Deputy Director, Newsletter Editor
Ruth Ben Shaul
Nama Zabar
Abraham Blum
Miryam Ben Peretz
Haym Hadomi
Shimshon Novick
Joseph Nussbam
Reuben Lazarovitz

PROJECT HISTORY:

Principal Initiator(s): Dr. Pinchas Tamir

Reason(s) for Project Initiation: To improve the education of science teachers at the pre-service and in-service stages and to coordinate efforts on a national level.

Evolution and Development of the Project: The project started as a workshop comprising about forty science educators engaged in teacher training in all institutions of higher education in Israel. The workshop was directed by three staff members of the British Science Teacher Education Project (STEP). Since then STEP materials have been adapted and original materials have been locally designed.

PROJECT OBJECTIVES:

Overall Project Purpose: To provide science teacher training materials which exemplify the inquiry approach and integrate theory and practice in order to improve the level of the science teachers and science teaching in Israel.

Specific Objectives:

1. Translate, adapt, trial and disseminate STEP materials.
2. Design and disseminate original materials for training science teachers which reflect local problems, local programs and local styles.
3. Create clearinghouse for teacher training materials.
4. Organize meetings and conferences for exchange of ideas and interaction among teacher trainers.
5. Publish a newsletter.
6. Conduct trials and research studies related to different strategies of teacher training.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: The target population is faculty in institutions of higher education who are engaged in training and education of science teachers.

Ways in which it differs from similar or previous programs: This is a national project organized and operated as a joint project of all institutions of higher education. It is based on the approach of STEP in England, operates in an adaptation, trial and dissemination framework, but at the same time seeks to develop local original activities to fit specific local circumstances and requirements.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Work and Activity Sheets in Different Areas	not given	ISTEP
Games	not given	ISTEP
Tapes, Videotapes	not given	ISTEP
Newsletter	not given	ISTEP

PRESENT COMMERCIAL AFFILIATIONS: Not Answered

MATERIALS AVAILABLE FREE: Not Answered

ADDITIONAL MATERIALS BEING DEVELOPED:

Similar materials in various areas.

TEACHER PREPARATION:

Consultant Services: Meetings and conferences.

Pre-service and In-service Training: Workshops have been organized by the Israel Science Teaching Center and the British Council.

Pre-service and In-service Teaching Materials: See British STEP materials as well as the materials of the Australian Science Teacher Education Project.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Pertinent Research Studies: Not answered

In-House or Unpublished Research: Materials have been used since 1975. Feedback provided by oral communication has been positive and encouraging.

PROJECT PUBLICITY:

HEMED Newsletter No. 1, December 1975.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not Answered

PLANS FOR THE FUTURE: Not Answered

PHYSICS-CHEMISTRY PROJECT (IN ISRAEL)

Curriculum Center
Ministry of Education and Culture
Jerusalem
ISRAEL

Telephone: 02 - 817250

Director: Nathan Orpaz

Project Duration : 1967-

Additional information, see also
Clearinghouse Reports: 8, 7

Age: 12-16
Ability: average, slow learner, above average
Subject: chem, phys
Language: Hebrew
Translations: none
Testing of Students: written achievement tests, oral tests, teacher judgments

Materials Developed by Project:

Print
- Textbooks
- Lab Books
- Supplementary Books
- Activity Sheets
- Tchr. Manuals
- Eval. Materials

Non-Print
- Games
- Models
- Lab Equipment

Types of Learning Experiences:
- Discussion
- Independent Study
- Lab Activities
- Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Eli Dori, Yechiel Sherman, Pinchas Vardin, Moshe Ben-Dov, Arishai Dekel, Dr. Shimshon Novick, Dr. Naava Ben-Zwi, Israelit Gottlieb.

PROJECT HISTORY:

Principal Initiator(s): Dr. Nathan Orpaz and Dr. Ruth Ben-Zvi

Reason(s) for Project Initiation: To develop a combined Physics-Chemistry Project for grades 7-9 for the new Israel Middle Schools.

Evolution and Development of the Project: The project completes the development of curricular materials for average and above average learners. It develops new materials for disadvantaged students.

PROJECT OBJECTIVES:

Overall Project Purpose: Objectives for average learners are discussed in the Eighth Report of the International Clearinghouse. For disadvantaged students: To develop a course of study based on learning experiences which could contribute to the cognitive development of disadvantaged students and increase their motivation to study science.

Specific Objectives: For disadvantaged students: To develop course materials which parallel in content the materials developed for average and above average students but are characterized by activities which increase the success of disadvantaged students.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students in grades 7-9. Average Learners: Upper 20 to 25 percent of students. For disadvantaged: Lower 50 percent of students.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Source
For Average Students:	United Publishers Co. Karlebach 29, Tel-Aviv
1. The Structure of Matter. 7th grade course, Commercial Edition	
2. Electricity. 8th grade course, Commercial Edition	
3. Force, Mass and Weight. 8th grade course, Commercial Edition	
4. Energy and Electricity. 9th grade course, Second Trial Edition	
5. From Elements to Compounds cooperation with the Rehovot Chemistry Group, 8th grade course. First Trial Edition	
6. The Properties of Gases. 8th grade course. Second Trial Edition	

All these materials include Teacher's Guides, Equipment Catalogues, Evaluation Questions, Workbooks.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material

For Disadvantaged Students: Available from MAALOT United Publishers (No costs given).

1. The Electric Current, Module for 8th grade, Commercial Edition
2. Electricity and Magnetism, Module for 8th grade, Commercial Edition
3. Electricity and Chemistry, Module for 8th grade, First Trial Edition
4. Background Readers, 5 booklets emphasizing biographies of scientists and technical applications of scientific inventions, Commercial Edition
5. Equipment kits for individualized projects, First Trial Edition

PRESENT COMMERCIAL AFFILIATIONS:

MAALOT United Publishers Company, Karlebach 29, Tel-Aviv

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

For disadvantaged Students: 9th grade materials dealing with concepts of "Force Mass and Energy" planned for 1976-1979, 7th grade materials dealing with "The Structure of Matter" planned for 1977-1979.

TEACHER PREPARATION:

Consultant Services: Pedagogic Centers, Project disseminators, Science Supervisors, Science Department Heads in Schools - all these are the agents of the project implementation program.

Pre-service and In-service Training: Two types of courses:

1. In-service institutes for project disseminators and departments heads.
2. Pre-service and in-service training of teachers.

All these are financed by the Ministry of Education

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Pertinent Research Studies: none

Availability of Evaluative Data: None in English. Evaluation Report in Hebrew.

PROJECT PUBLICITY: None

PROJECT ACTIVITIES SINCE 1974 REPORT: Developing materials for the disadvantaged.

PLANS FOR THE FUTURE:

Will be developing 7th and 9th grade materials for the disadvantaged.

BIOLOGY CURRICULUM DEVELOPMENT AND EVALUATION (BCDE)

Science Education Research Center
National Institute for Educational Research
5-22, Shimomeguro 6-chome,
Meguro-ku,
Tokyo, JAPAN

Telephone: (03) 714-0111

Director: Hisao Morikawa

Project Duration: 1974-1977

Additional information, see also the 20-Year Cumulative Directory for title change.

Age: 16, 17, 18
Ability: all
Subject: biology
Language: Japanese
Translations: none
Testing of Students: written achievement tests, laboratory performance tests, student attitude questionnaire

Materials Developed by Project:

Print
- Textbooks
- Lab Books
- Activity Sheets
- Tchr. Manuals
- Eval. Materials (tests)
- Behavioral Objectives
- Overview of Project

Non-Print
- Slides
- Overhead Trans.
- Videotape
- Models
- Lab Equipment

Types of Learning Experiences:
- Discussion
- Independent Study
- Field Experiences
- Demonstrations
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

Yujiro Nakajima, General Coordinator

PROJECT HISTORY:

Principal Initiator(s): Dr. Haruo Kinoshita

Evolution and Development of the Project: The original project was directed by Haruo Kinoshita from 1971 to 1973 under the title, "Improvement of High School Biology Curriculum". The present project under the direction of Hisao Morikawa, is a follow up to the original project.

PROJECT OBJECTIVES:

Overall Project Purpose: To provide flexible curricula for High School Biology, by developing many modules (including reading materials, wet-lab guides, dry-lab sheets, field work guides, audio-visual materials, test sheets, and teacher's guides).

Specific Objectives:

1. To provide behavioral objectives for each module.
2. To provide students with opportunities for independent and individualized learning.
3. To provide teachers with opportunities for participating in curriculum development.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Average upper secondary school students from 10th to 12th grade (ages 16-18), in Japan.

Ways in which it differs from similar or previous programs:

1. Modular approach in developing curricula.
2. Experimental approach in evaluating the developed materials.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
44 different kinds of modules for student use	Not Given	*
Teacher's guide for each module	Not Given	*
Newsletters No. 1 - No. 3 (written in Japanese)	Free	BCDE

PRESENT COMMERCIAL AFFILIATIONS:

*Asakura-shoten
Shin ogawa-machi 2-10
Shijuku-ku
Tokyo, Japan

Date of latest edition: October, 1976

MATERIALS AVAILABLE FREE: See Materials Already Produced, Including Sources and Costs.

ADDITIONAL MATERIALS BEING DEVELOPED:

Final reports (vol. I and vol. II) to be published around October 1976 and May 1977.

TEACHER PREPARATION: None

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Pertinent Research Studies: 1974-1975 proceeding report to be published in March, 1976.

In-House or Unpublished Research: Data has been obtained which indicates that students' attitudes to science and biology are remarkably changed by using these modules.

PROJECT PUBLICITY: Not answered.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered.

PLANS FOR THE FUTURE: Not answered.

STUDIES ON THE INTEGRATED SCIENCE CURRICULUM (SISC)

National Institute for Educational Research
6-5-22, Shimomeguro, Meguro-ku
Tokyo 153 JAPAN
Telephone: 03-714-0111

Director: Hideo Ohashi

Project Duration: 1975-1977

Age: 13-18
Ability: all
Subject: integrated sciences, soc. sci.
Language: Japanese
Translations: none
Testing of Students:
- written achievement tests
- lab. performance tests
- teacher judgments
- interest inventories

Materials Developed by Project:

Print	Non-Print
Overview	

Types of Learning Experiences:
- Lecture
- Seminar
- Discussion
- Lab Activities
- Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Hideo Ohashi, Director, coordination
Bunichi Tamamushi, Director, development historical approach of the course
Yasuo Akizuki, Director, teacher training

PROJECT HISTORY:

Principal Initiator(s): Bunichi Tamamushi

Reason(s) for Project Initiation: To improve science teaching as part of general education.

Evolution and Development of the Project: The project team was formed in Nov. 1974, applied for the grant-in-aid. In 1975, such problems of integrated science teaching as 1) history and experiences of integrated science teaching, 2) use of "history of science" in the teaching of science, and 3) teacher training, were discussed and defined, and a course syllabus was outlined. In 1976, manuscripts of readings for teachers will be written.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop an integrated science course for all students in grades 7-12.

Specific Objectives: To develop interest in science, and to appreciate the role of science in the society and the interdependent relationships between science and culture.

Natural sciences, represented by such scientists as Galileo, Newton, Lavoisier, Dalton, Darwin, Pasteur, Einstein, Bohr, etc., have been closely related with various aspects of culture. The course will be based on a series of such basic problems as "How was the Ptolemaic theory replaced by the heliocentric theory?" "How was the theory of spontaneous generation replaced by new theory of life?" "How did the phlogiston theory lead to the oxidation theory?" etc.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All students in grades 7-12.

Ways in which it differs from similar or previous programs: Use of history of science, problem oriented approach, and emphasis on seminar, discussion and laboratory activities.

STUDIES ON THE INTEGRATED SCIENCE CURRICULUM (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
"Basic Problems of Integrated Science Teaching," 1975, 102 p.	Not Given	SISC
"Trends and Critics of Integrated Science Teaching," 1975 8 p.	Not Given	SISC

PRESENT COMMERCIAL AFFILIATIONS: Not answered

MATERIALS AVAILABLE FREE: Not answered

ADDITIONAL MATERIALS BEING DEVELOPED:

Readings for teachers on: Darwin, Pasteur, Dalton, Galileo, Newton, Lavoisier, Bohr, and Einstein.

TEACHER PREPARATION: Not answered

PROJECT EVALUATED:

Yes ____ No _X_ Internal ____ External Agency ____

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE: Not answered

THE STUDY TO MODERNIZE THE PHYSICS CURRICULUM OF UPPER SECONDARY SCHOOL (KBGK)

University of Tokyo
College of General Education
Meguro-ku, Komaba
Tokyo,
JAPAN 153

Telephone: (Tokyo) 03-467-1171 Ext. 341 or 347

Director: K. Ishiguro

Project Duration: 1971-1977

Additional information, see also
Clearinghouse Reports: 9

Age: 15-17
Ability: average
Subject: physics
Language: Japanese
Translations: none
Testing of Students:
teacher judgments

Materials Developed by Project:

Print	Non-Print
Textbooks	Slides
Supplementary Books	Filmloops
	Overhead Trans.

Types of Learning Experiences:

- Lecture
- Discussion
- Lab Activities
- Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Koichi Shimoda, Co-Director
Masataka Ariyama, Treasurer-Secretary

PROJECT HISTORY:

Principal Initiator(s): Haruo Ohtuka

Reason(s) for Project Initiation: To promote science education in general.

Evolution and Development of the Project: Under the supervision of originator Prof. H. Ohtuka, K. Ishiguro organized the project team consisting of physics professors of the major universities in each district.

PROJECT OBJECTIVES:

Overall Project Purpose:

The objective of this project is to present a physics curriculum which could influence the future revision of the recommendation of the Ministry of Education for "Course of Study for Upper Secondary Schools".

Specific Objectives:

The major goal of this project is to present a physics curriculum through which students will realize that physics is an interesting subject and that is should be afforded a position in the central core of the curriculum of upper secondary schools, even when the humanistic point of view is emphasized.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students of average ability aged 15-17.

Ways in which it differs from similar or previous programs:

Some emphasis may be put on the description of the criteria by which we judge the correctness of the laws of Physics, since it is very helpful even for students who will select non-scientific professions to know what these criteria are and how they differ from the criteria of other fields, such as mathematics, the social sciences and literature.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Education of Physics in Japanese Upper Secondary Schools (in English). Survey of Literature on Physics Education edit. by ICPE Edinburgh, (1975)	Not Given	Asakura Shoten Publishing Co.*

KBGK (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material	Cost	Source
KBGK Draft No. one (1973) (in Japanese) B5 188 pages	Free	Asakura Shoten Publishing Co.*
KBGK Draft No. two (1974) (in Japanese) B5 272 pages	Free	"
KBGK Draft No. three (1975) (in Japanese) B5 180 pages	Free	"

PRESENT COMMERCIAL AFFILIATIONS:

*Asakura Shoten Publishing Co.
Ghinjuku-ku, Shin Ogawa-machi 2-10
Tokyo, Japan 162

Date of latest edition: March, 1977 (now in preparation)

MATERIALS AVAILABLE FREE: See Materials Already Produced, Including Sources and Costs.

ADDITIONAL MATERIALS BEING DEVELOPED:

KBGK Physics Vol. one (Grammar of Natural Science)
Dynamics, Electromagnetism and Appendix (Collected papers on Physics Education)
KBGK Physics Vol. two (Topical Treatises on Miscellaneous Subjects of Physics)

These are to be published by Asakura Shoten.

TEACHER PREPARATION:

Consultant Services: Joint meetings of members of university and high school teachers are held in each district monthly or bi-monthly to exchange information.

Pre-service and In-service Training: The number of participants in the Tokyo meeting is usually about 25 and the cost of a meeting is about ¥ 30000 (U. S. $100). The meetings are financed by the fund of the Ministry of Education.

Pre-service and In-service Teaching Materials: None at present time.

PROJECT EVALUATED: Not answered

PROJECT PUBLICITY:

K. Ishiguro: Dissolution of "Physics" as a Course in Senior High School Education
J. Phys. Ed. Soc. Japan 23 No. 33 (1975) 139.
K. Nishikawa, M. Ishigeta: Critics on Ishiguro's Proposal
J. Phys. Ed. Soc. Japan 24 No. 1 (1976) 51.

PROJECT ACTIVITIES SINCE 1974 REPORT:

The effort is mainly directed to finding an answer to the difficult problem: What is the role of Physics education in a general education system which is expected to educate mixed students who might or might not need physical knowledge in the future? A tentative solution is proposed in the literature cited above.

PLANS FOR THE FUTURE:

The project will be completed at the end of 1976 by publishing a resource book for high school physics teachers with a proposal for desired construction of basic science courses.

A new project may be started in 1977 to study the possibility of making physics education more effective in promoting humanistic education.

EDUCATIONAL TELEVISION (ETV)

Educational TV Unit
Center for Educational Research
and Development (CERD)
Dekwaneh, P.O. Box 9336
LEBANON

Telephone: 269860-1-2-3-4

Directors: Wadih Haddad and
Kifah Fakhoury

Project Duration: 1975-

Age: 5-adult
Ability: all
Subject: biol, chem, phys, earth-space, math, soc. sci, ed tech, languages
Language: English, French, Arabic
Translations: none
Testing of Students: written achievement tests
standardized tests
(applies only to students of teacher training colleges)

Materials Developed by Project:

Print	Non-Print
None	Films Videotape

Types of Learning Experiences:
Lab Activities
Televised Lessons

PRINCIPAL PROFESSIONAL STAFF:

A team of about 30 teachers selected from teacher training colleges, with four TV production specialists, and supported by a team of technicians.

PROJECT HISTORY:

Principal Initiator(s): Dr. Wadih Haddad

Reason(s) for Project Initiation: Originally planned for 1977-1978 using TV as means of instruction; timetable was accelerated due to events in Lebanon, schools and teacher training college closed. TV supplied instruction for children and students at home.

Evolution and Development of the Project:

The evolution and development of the program were dictated by the evolution of the military and political situation in Lebanon.

1. First Period: November-December, 1975: School T.V.
   - Almost all schools were closed.
   - Using the 6 T.V. channels in Lebanon from 8a.m. to 6p.m., Monday through Saturday and 12:30 p.m. to 6:00 p.m. on Sunday, CERD supplied 15 minute periods (instead of the normal 50 minute classroom periods) to all Lebanese children from primary I to secondary III (5 primary; 4 intermediate, 3 secondary levels).
2. Second Period: February 1976-September 1976: Educational T.V.
   - Almost all schools are back to normal
   - CERD planned the following programs (on 6 T.V. channels)
     a. teacher training colleges programs (2nd and 3rd years)
        - all subjects
        - lectures on T.V. Students receiving instruction either at home or in classrooms with their teacher.
        - consultations and activities at teacher training colleges
        - Monday to Thursday, 8:00 a.m. to 2:00 p.m.

     b. In-service training of science and mathematics teachers.
        - Monday to Friday, 30 minutes daily.
        - Consultations at teacher training colleges.

     c. "Enrichment" programs in mathematics, sciences and arts for all children in primary, intermediate and secondary schools.
        90 minutes daily - Monday through Thursday
        120 minutes daily Friday through Sunday

PROJECT HISTORY: (continued)

Evolution and Development of the Project: (continued)

d. general education programs for adults due to start early in April, 1976

PROJECT OBJECTIVES:

Overall Project Purpose: Supply instruction to teacher training college students, help school children understand some subjects better and give the general public interesting programs about subjects on the Lebanese natural and socio-economic environment.

Specific Objectives:

a. recording on videotapes all ETV programs for use in pre and in-service training of teachers.
b. large-scale use of T.V. as means of instruction.
c. bringing school to the home and allowing parents to see what their children are learning.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: School population (children & teachers) and adults in Lebanon.

Ways in which it differs from similar or previous programs: Differs because of its wide spectrum of users.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Videotape of all programs already televised since January 26, date of start of educational T.V.	Not Given	ETV

PRESENT COMMERCIAL AFFILIATIONS: Not answered

MATERIALS AVAILABLE FREE: Not answered

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION:

Consultant Services: Consultations with staff of CERD and with teachers in teacher training colleges.

Pre-service and In-service Training: Programs operated and financed by CERD, approximate cost: $1,000 - $2,000 daily.

Pre-service and In-service Teaching Materials: Facilities of the teacher training colleges.

PROJECT EVALUATED:

Yes _____ No X Internal _____ External Agency _____

In-House or Unpublished Research: In November and December, 1975, research on the use of school TV was conducted to evaluate all aspects and details of the televised lessons. Results encouraging. Report is being written.

PROJECT PUBLICITY: Not answered.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE: No definite plans in view. The future of the project is under study.

INTERMEDIATE SCHOOL SCIENCE PROJECT (ISSP)

Michel Kraidy, Chairman
Science Department
Center for Educational Research
and Development (CERD)
Dekwaneh, LEBANON
P.O.B. 9336

Telephone: 269860-1-2-3-4

Directors: Wadih Haddad and
Michel Kraidy

Project Duration: 1970-1977

Additional information, see also Clearinghouse Reports: 9 and the 20-Year Cumulative Directory for title change.

Age: 11-14
Ability: all
Subject: integrated science
Language: English, French, some Arabic
Translations: none
Testing of Students: written achievement, lab performance and oral tests; teacher judgments

Materials Developed by Project:

Print
- Integrated Text and Lab Books
- Supplementary Books
- Tchr. Manuals
- Eval. Materials

Non-Print
- Slides
- Filmstrips
- Films
- Videotape
- Models
- Lab Equipment
- Mobile Lab
- Specially Designed Lab for New Schools

Types of Learning Experiences:
- Lecture
- Discussion
- Lab Activities
- Field Experiences
- Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Various science teachers and educators. The first edition of books was written by the Science and Mathematics Education Center at The American University of Beirut, by contract from CERD

PROJECT HISTORY:

Principal Initiator(s): Dr. Wadih Haddad, Science and Math Education Center, American University of Beirut.

Reason(s) for Project Initiation: Need for up-dating science teaching in intermediate schools.

Evolution and Development of the Project:
1. Preliminary research leading to official syllabus: 1970
2. Published materials: textbooks and teacher's guides - 1971-1974
3. Accompanying teaching aids - 1972-1975
4. In-service training of approximately 650 teachers annually - summers of 1971-2-3-4-5
5. Pre-service training of approximately 100 teachers - 1971-Present
6. In-service training of 650 teachers - workshop on laboratory techniques - August 1975. Publication of a manual on laboratory techniques for teachers of intermediate schools - August 1975
7. Evaluation of project - 1974-1978

PROJECT OBJECTIVES:

Overall Project Purpose: To present intermediate school science in a way which will enable the students to understand that science is a body of organized knowledge as well as a method of learning about nature.

Specific Objectives: The processes of observation, measurement, classification, experimentation, interpretation and problem-solving, in general should be illustrated and explained to the children and opportunities given to them to practice these skills. Concepts and principles should not be presented in a theoretical form but should be derived from a number of observations and practical experiences carried out by the students.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All Lebanese children in intermediate schools (ages 11-14).

UNIQUE CHARACTERISTICS OF THE PROJECT: (Continued)

Ways in which it differs from similar or previous programs: Previous programs were too theoretical and too classical. Present programs integrate lab and class activities and are environmentally oriented.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Published Materials: a) Intermediate Science I to IV (Textbooks and Teachers' Guides) French and English Editions; b) Laboratory Techniques Manual for Teachers of Science in Intermediate Schools (In Arabic)	Not Given	CERD
Tests for First Year Intermediate School (In Evaluation Stage)	Not Given	CERD
Slides and Filmstrips about Lebanese Environment (In Prototype Stage - Not yet commercially produced)	Not Given	CERD
Videotapes for Teacher Training Purposes	Not Given	CERD
Models, Lab Equipment, Mobile Lab (In Prototype Stage)	Not Given	CERD

PRESENT COMMERCIAL AFFILIATIONS:

Center for Educational Research and Development (CERD)
Dekwaneh
LEBANON, P.O.B. 9336

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: Tests for years II, III and IV.

TEACHER PREPARATION:

Consultant Services: Personal consultations with staff of science department at CERD. Consultations with science teachers and educators at the Training College for Teachers of Intermediate Cycle (TCTIC).

Pre-service and In-service Training: Pre-service in TCTIC - program of three years still on a trial basis. About 100 students in science -- operating from October to June. In-service in intermediate and primary training colleges -- four to eight weeks in summer and follow-up in winter -- about 650 teachers annually.

Pre-service and In-service Teaching Materials: Training in laboratories and buildings of teacher training institutes. Basic equipment--difficult to estimate cost. Operating equipment--$20-60,000 annually. All teacher preparation operated and financed by CERD.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

In-House or Unpublished Research: Collecting evaluation data was delayed by events in Lebanon -- hope to have results by 1977.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT:

Pre-service training, in-service training, publication of laboratory manual for teachers and project evaluation.

PLANS FOR THE FUTURE:

1. Various meetings and seminars with teachers and educators.
2. New seven-year project for science in intermediate schools planned by CERD to start in 1976.

PRIMARY SCHOOL MATHEMATICS PROJECT (PSMP)

Rafik Eido, Chairman
Mathematics Department
Center for Educational Research
and Development (CERD)
Dekwaneh, LEBANON
P.O. Box 9336

Telephone: 269860-1-2-3-4

Directors: Wadih Haddad & Rafik Eido

Project Duration: 1971-1977

Age: 5-10
Ability: all
Subject: math
Language: Arabic
Translations: none
Testing of Students:
written achievement tests
teacher judgments

Materials Developed by Project:

Print	Non-Print
Textbooks	Films
Tchr. Manuals	Models
Eval. Materials (tests)	Lab Equipment

Types of Learning Experiences:

Lecture
Discussion
Lab Activities
Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Various mathematics teachers and educators.

PROJECT HISTORY:

Principal Initiator(s): Dr. Wadih Haddad

Reason(s) for Project Initiation: The need to update mathematics teaching in primary schools.

Evolution and Development of the Project:

1. Preliminary research leading to official syllabus - 1971
2. Publishing material
   a. textbooks - 1972-1975
   b. teachers' guides - 1972-1975
3. Accompanying teaching aids, 1972-1975
4. In-service teacher training, summers of 1973, 1974, 1975
5. Pre-service teacher training, 1973, 1974, 1975...present
6. Evaluation of project - first and second year, 1974; third, fourth, and fifth years, not started yet

PROJECT OBJECTIVES:

Overall Project Purpose: The official syllabus was prepared bearing in mind the needs of those pupils whose formal education ceases at the end of the primary cycle as well as those who continue their schooling thereafter. This syllabus is based on new techniques of instruction in which mathematical concepts are to be acquired by a child from concrete situations using the processes of comparisons, inquiry and discovery. These processes will enable the child to understand concepts rather than memorize facts.

The role of the teacher in this scheme is mostly limited to organization and guidance.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All Lebanese children in primary school (ages 5-10).

Ways in which it differs from similar or previous programs: Previous program was out of date, in terms of subject matter, ways of teaching and teacher's role.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Mathematics, Primary 1, 2, 3, 4, 5	$2.00	CERD
Teachers' Guides 1, 2, 3, 4, 5	2.50	CERD
Audio Visual Aids - Blocks, Spheres, Cylinders, Abaci, etc.	Not Given	CERD
Films	Not Given	CERD

PRESENT COMMERCIAL AFFILIATIONS:

CERD (Center for Educational Research and Development)
Dekwaneh, LEBANON
P. O. Box 9336

Date of latest edition: June, 1975

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: None

TEACHER PREPARATION:

Consultant Services: None other than personal contact with CERD staff

Pre-service and In-service Training: Pre-service teacher training takes place in seven institutes (normal schools). In-service training takes place in the same institutes in summer. Activities include: lectures, workshops and regular class instruction. The Center for Educational Research and Development financed the different sessions, in which approximately 3,000 teachers from state and private schools were enrolled.

Pre-service and In-service Teaching Materials: In-service teaching materials include typed lectures, teaching aids (audiovisual and otherwise), published textbooks. Other than the textbooks, material is not purchasable.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Pertinent Research Studies: None

In-House or Unpublished Research: Evaluation was conducted by a group of mathematics educators who analyzed the data of a questionnaire that was addressed to primary school children and teachers. Interviews with teachers and children were also conducted.

Availability of Evaluative Data: Evaluative data on the first two years is available in the Center (CERD mathematics department).

PROJECT PUBLICITY: None

PROJECT ACTIVITIES SINCE 1974 REPORT:

Implementation in schools (State schools and some private schools).
Teacher Training.
Production of teaching aids.
Evaluation of material.

PLANS FOR THE FUTURE:

Evaluation of material (Cont.) 1976-1977
New Syllabus or Amendment in the present one - 1977-1978
Preparation of new material - 1978-1979
Production of teaching aids and equipment (Books and others) 1979-1980
Application - 1980

PRIMARY SCHOOL SCIENCE PROJECT (PSSP)

Michel Kraidy
Chairman, Science Department
Center for Educational Research
and Development (CERD)
P.O.B. 9336
Dekwaneh, LEBANON

Telephone: 269860-1-2-3-4

Director: Wadih Haddad

Project Duration: 1971-1977

Additional information, see also the 20-Year Cumulative Directory for title change.

Age: 5-10
Ability: all
Subject: integrated sciences
Language: Arabic
Translations: none
Testing of Students:
  written achievement tests
  lab performance tests
  oral tests
  teacher judgments

Materials Developed by Project:

Print	Non-Print
Integrated Text and Lab Books	Filmstrips
Tchr. Manuals	Lab Equipment
Eval. Materials	Mobile Lab

Types of Learning Experiences:

- Lecture
- Discussion
- Lab Activities
- Field Experiences
- Demonstrations

PRINCIPAL PROFESSIONAL STAFF: Dr. Michel Kraidy, Chairman of Science Department, CERD.

Various science teachers and educators; first edition was written by the staff of the Science and Mathematics Education Center at the American University of Beirut by contract from CERD.

PROJECT HISTORY:

Principal Initiator(s): Dr. Wadih Haddad

Reason(s) for Project Initiation: Need for updating science teaching in primary schools.

Evolution and Development of the Project:

1. Preliminary research leading to official syllabus, 1971.
2. Published materials:
   - textbooks and teachers' guides, 1972-1975.
   - accompanying teaching aids, 1972-1975.
3. In-service training of approximately 3,000 teachers annually, summers of 1973, 1974, 1975.
4. Pre-service training of approximately 1,000 teachers annually, 1973 - present.
5. Evaluation of project, 1975-1977.

PROJECT OBJECTIVES:

Overall Project Purpose: Developing scientific attitudes, skills and inclinations in children through familiarity with their surroundings and environment.

Specific Objectives:

a. stressing visual observation.
b. motivating children to use the scientific method of investigation through: observation; intelligent guessing; planning of experiments; experimenting; right attitude towards failure; consulting with others; searching in different sources of learning.
c. social interaction among children through individual experiences.
d. use of simple and familiar material by children so that they may pursue investigations outside classroom.
e. stressing independent work.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All Lebanese children in primary school, ages 5-10.

Ways in which it differs from similar or previous programs: Previous programs were out of date, relying mostly on memorizing. Present programs integrate lab work with classroom activities.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Science Primary I to V		
a. Textbook	$2.00/item	CERD
b. Teachers' Guide	$2.00/item	CERD
Mobile Lab for Primary Schools	Not Yet Purchasable	CERD
Filmstrips (being developed)	Not Given	CERD

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: None

TEACHER PREPARATION:

Consultant Services:

- Personal consultations with staff of science department at CERD.
- Consultations with science teachers at teacher training schools.

Pre-service and In-service Training:

Pre-service - In 9 teacher training institutes, program of three years, about 3,000 students, operating from October to June.
In-service - In teacher training colleges, 6 weeks in summer and follow-up during winter, about 3,000 teachers each summer.

Pre-service and In-service Teaching Materials:
- Training done in laboratories of teacher training institutes.
- Basic equipment: cost difficult to estimate.
- Operating equipment: approximately $50,000 annually.

All teacher training operated and financed by C.E.R.D.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Pertinent Research Studies: None

In-House or Unpublished Research: Collecting evaluation data was delayed by events in Lebanon; hope to have results for next year.

Availability of Evaluative Data: Not available.

PROJECT PUBLICITY: Not answered.

PROJECT ACTIVITIES SINCE 1974 REPORT: In-service training, pre-service training, project evaluation.

PLANS FOR THE FUTURE:

- various scheduled and unscheduled meetings and seminars with teachers in project, and with educators in Lebanon.
- new seven-year plan for science in primary schools to start in 1977.

MALAYSIAN GENERAL SCIENCE PROJECT (MGSP)

Curriculum Development Centre
Ministry of Education
2½ ml., Jalan Damansara
Kuala Lumpur - 23-01
MALAYSIA

Telephone: 741522

Director: Yoong Suan

Project Duration: 1971-1978

Additional information, see also Clearinghouse Reports: 9 and the 20-Year Cumulative Directory for title change.

Age: 15-17
Ability: lower ability non-science pupils
Subject: biol, chem, phys
Language: English
Translations: Malaysian
Testing of Students:
  written achievement tests
  teacher judgments
  student attitude q're
  interest inventories
  classroom observation
  analysis of instructional materials
  in-service training evaluation

Materials Developed by Project:

Print	Non-Print
Textbooks	Slides
Supplementary Books	Filmstrips
Tchr. Manuals	Overhead Trans.
Eval. Materials	Lab Equipment
Newsletters	
Charts	

Types of Learning Experiences:
Lecture
Discussion
Lab Activities
Field Experiences
Demonstrations

PRINCIPAL PROFESSIONAL STAFF: Not answered

PROJECT HISTORY:

Principal Initiator(s): Schools' Division of the Ministry of Education.

Reason(s) for Project Initiation: A new science course (Integrated Science) had been introduced at the lower secondary level. The Malaysian Pure Science Project, which caters to arts students, has been introduced at the upper secondary level.

Evolution and Development of the Project: MGSP initially adapted the Nuffield Secondary Science Project (England) materials. The materials are still being tried out in schools. The Curriculum Development Centre (CDC) conducted formative evaluations in 1974 and 1975. In 1976, the materials will be revised, field tested, and finalized so that the materials can be published by January 1978. The trial MGSP materials consist essentially of pupil's texts and teacher's guides. The revised materials will also include supporting materials: filmstrip, slides, transparencies, charts, in-service/pre-service manuals. Revised materials will be locally based rather than adaptations.

PROJECT OBJECTIVES:

Overall Project Purpose: MGSP develops a curriculum for those who do not want to or who are unable to specialize in science (i.e. arts students). In Malaysia, these students are generally the lower ability group. Thus the emphasis is on functional science rather than on theoretical science. The program serves the needs of the common man by enabling him to appreciate the scientific approach to a problem as well as the role of science in society and in everyday living. In other words, MGSP aims at providing education through science as well as education in science.

Specific Objectives:

1. Emphasis on understanding rather than acquisition of facts and knowledge.
2. Learning science through activities and practical work rather than chalk-talk, textbook memorization or cookbook experimentation.

PROJECT OBJECTIVES: (continued)

Specific Objectives: (continued)

3. Learning relevant and functional science that is closely related to the local environment and the modern world.
4. Developing and encouraging pupils to ask questions and question evidence before arriving at decisions.
5. Appreciating the way scientists approach a problem.
6. Appreciating the significance of science in present day society and everyday living.
7. Appreciating the contribution of science to modern living.
8. Acquiring basic scientific vocabulary so as to appreciate writings in science, or science reports in mass media (newspaper, radio or TV).
9. Providing interesting and exciting experiences in science learning.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Pupils, aged 15-17 who did badly in Integrated Science or General Science in the Public examination at lower secondary schools, and a small proportion of those who are able to learn science but who are not interested in doing so. Lower ability group - poor in language (English as second language).

Ways in which it differs from similar or previous programs: It is the first project with a built-in formative evaluation process. The evaluation involves the use of multiple techniques to solicit data for revision: achievement tests, school visits, teacher feedback, attitudes/interests of pupils and teachers (through questionnaire), analysis of instructional materials, classroom observation (interaction analysis), review of apparatus and science room projects, and the evaluation of in-service training.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Modern Science for Malaysian Schools: Form IV	M$3.50	Longmans
Modern Science for Malaysian Schools: Form IV Teacher's Guides	Free	Longmans
Modern Science for Malaysian Schools: Form V	M$4.20	Longmans
Modern Science for Malaysian Schools: Form V Teacher's Guides	Free	Longmans

(All 4 are trial editions)

PRESENT COMMERCIAL AFFILIATIONS:

Longmans (Malaysia) Sdn. Bhd.,
Wisma Damansara,
Kuala Lumpur,
Malaysia

MATERIALS AVAILABLE FREE:

Malaysian General Science Project - project pamphlet, available from CDC.
Teacher's Guides available free from the publisher with each purchase.

ADDITIONAL MATERIALS BEING DEVELOPED:

Revised editions of above (Jan. 1978)
Wall charts related to course work (1978)
Film strips, Slides and Overhead Transparencies (1978-79)

ADDITIONAL MATERIALS BEING DEVELOPED: (continued)

Teacher In-Service Manual (also Pre-Service)
Teacher handbooks (supportive materials)

TEACHER PREPARATION:

Consultant Services: School visits to trial schools and use of newsletters and correspondence.

Pre-service and In-service Training: In-service courses: Each teacher teaching Malaysian General Science must undergo a 2-week in-service course for each year's course; this is financed by the Ministry of Education; MGSP also trains in-service course tutors. Follow-up workshop/conference or week-end courses in different regions or states. Liaison with University Education Faculties and Teachers' Colleges for Pre-service training.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

In-House or Unpublished Research: Evaluation Reports on: (1) School Visits 1974; (2) School Visits 1975; (3) Classroom Observation; (4) Analysis of Instructional Materials; (5) Teacher's and Pupil's Attitude/Interest towards MGSP; (6) Pupils achievement in MGSP; (7) Evaluation of MGSP In-service course; (8) Review of Apparatus and the Science Room Project.

Availability of Evaluative Data: The above reports: limited copies available on request from Curriculum Development Centre, Malaysia.

PROJECT PUBLICITY:

None. Malaysian education is centralized.

PROJECT ACTIVITIES SINCE 1974 REPORT:

1972-1973: Prepare trial materials
1974-1977: Tryout stage; 1974-1975: Evaluation
1976: Revision of curriculum materials; field trials of revised materials
1977: Finalizing for printing; Developing supporting materials and in-service manuals
1976-1977: Conduct in-service training/tutor training

PLANS FOR THE FUTURE:

April-May, 1976: Revision workshop/Conferences
June-Dec., 1976: Field trials of revised materials and evaluation
Jan.-March, 1977: Finalizing for printing
March 1977 - Dec., 1978: Developing supportive materials, etc.

CHINESE JUNIOR SECONDARY SCIENCE PROGRAM (CJSSP)

Kuan-Jen Yang
Science Education Center
National Taiwan Normal University
Sect. 5 No. 88 Roosevelt Road
Taipei
REPUBLIC OF CHINA

Telephone: 932-0204

Director: Chu-Sheng Yeh Cheng

Project Duration: 1974-

Age: 12, 13, 14
Ability: average
Subjects: biol, chem, phys, earth science
Language: Chinese
Translations: none
Testing of Students:
- written achievement tests
- teacher judgments
- lab performance tests
- oral tests

Materials Developed by Project:

Print	Non-Print
Textbooks	Slides
Lab Books	Overhead Trans.
Tchr. Manuals	Lab Equipment
Eval. Materials (tests)	
Behavioral Objectives	

Types of Learning Experiences:
- Lecture
- Discussion
- Lab Activities
- Field Experiences
- Demonstrations
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

Dr. K. J. Yang (Director, Biology)
Dr. C. C. Chao (Physics and Science Education)
Dr. C. S. Lin (Psychology)
Dr. T. T. Shih (Earth Science)
Dr. C. T. Chen (Chemistry)
Prof. B. L. Fang (Pedagogy)
Prof. M. C. Liu (Biology)
Prof. M. T. Wei (Chemistry)
Prof. H. S. Su (Physics)

PROJECT HISTORY:

Principal Initiator(s): Chu-Sheng Yeh Cheng

Reason(s) for Project Initiation:

a. Change in philosophy
b. Develop new course

Evolution and Development of the Project:

In order to improve the quality of science teaching in secondary schools, the Ministry of Education, Republic of China, initiated this project in the spring of 1974 and authorized the National Taiwan Normal University to perform this task. A Curriculum Development Committee was set up in the Science Education Center of the University. The Committee had a multidisciplinary background: biology, chemistry, physics, psychology, pedagogy and earth sciences.

Based on a nation-wide questionnaire survey and on the result of investigations by science educators of the University, the Committee decided that an integrated science curriculum was most suitable for junior high schools in this country. During the first year of the project (1974-1975), CJSSP was concerned with developing the project philosophy and objectives. In addition to the development of the curriculum guidelines, a new syllabus for science courses was produced. The second two years (1975-1977) involved the writing of instructional materials, development of teaching equipment, and preparation of trial teachers. From 1977 to 1980, pilot tests of the materials will be conducted in 25 selected junior high schools throughout the nation.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop an integrated science curriculum for the junior secondary school as a part of the compulsory national curriculum in general education.

Specific Objectives:

a. To produce a new syllabus of science courses for the junior high school.
b. To develop instructional materials based on the new syllabus.
c. To train teachers to implement this new curriculum and to provide suitable teaching materials for this teacher training program.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Junior high school students, aged 12-14.

Ways in which it differs from similar or previous programs:

a. It introduces earth science into the Chinese junior high school curriculum.
b. It is suitable for use in an ordinary classroom.
c. It is a package program consisting of a new syllabus, text materials, teachers' guide, laboratory equipment and teacher training materials.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

None. Project is in developmental stage.

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered.

TEACHER PREPARATION: Not answered.

PROJECT EVALUATED: Not answered

PROJECT PUBLICITY: None

PROJECT ACTIVITIES SINCE 1974 REPORT: Not previously reported.

PLANS FOR THE FUTURE:

1976-1977	(1)	Completion and publication of instructional materials.
	(2)	Operation of a teacher training program.
1977-1980	(1)	Experimentation of the materials in 25 pilot schools.
	(2)	Evaluation and revision.

ELEMENTARY SCHOOL MATHEMATICS CURRICULUM DEVELOPMENT PROJECT OF REPUBLIC OF CHINA (ESMCD)

Taiwan Provincial Institute for Elementary
School Teachers' In-service Education
30 Ta Kwan Road, Pan-chao
Taipei Hsien, Taiwan
REPUBLIC OF CHINA 220

Telephone: 9614127

Director: Men-Fan Huang

Project Duration: 1974-1977

Age: 6-11
Ability: all
Subject: Math
Language: Chinese
Translations: none
Testing of Students:
oral tests,
standardized tests,
teacher judgments

Materials Developed by Project:

Print	Non-Print
Textbooks	
Supplementary Books	
Activity Sheets	
Tchr. Manuals	
Eval. Materials	
Behavioral Objectives	

Types of Learning Experiences:
- Lecture
- Discussion
- Field Experiences
- Demonstrations
- Simulations

PRINCIPAL PROFESSIONAL STAFF:

Dr. M. F. Huang,	Director
Dr. C. M. Leu,	Math Educational Expert
Dr. J. S. Shine,	" " "
Dr. S. L. Chiu,	" " "
Dr. Y. C. Kuo,	" " "
Mr. B. L. Fang,	Curriculum Expert
Dr. M. F. Chien,	Psychological Expert
Mr. C. H. Wu,	" "
Dr. M. Chen,	In-Service Training Expert
Mr. K. K. Wang,	" " "

PROJECT HISTORY:

Principal Initiator(s): Minister of Education

Reason(s) for Project Initiation: Change in philosophy, develop new course, update contents and methods.

Evolution and Development of the Project: In this project, mathematicians, educators, curriculum experts and psychologists work together to compare our curricula, teaching materials, teaching methods, and teaching aids in mathematics with those of the United States and Japan and then use these findings in the curriculum.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop a new curriculum in Mathematics for the elementary school as a part of the compulsory national curriculum. The curriculum will be tested in 40 classes starting September 1976, then 50 elementary schools from September 1977 on. After adjustment, it will be used throughout the country.

Specific Objectives: Elementary school Mathematics teaching in The Republic of China used to be lecture type, with very few activities designed for pupils. This project intends to change the situation by designing and introducing many pupil oriented activities into classrooms.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Since it is intended to be used as a national textbook, this project is for all the elementary school children (ages 6-11) throughout the country.

UNIQUE CHARACTERISTICS OF THE PROJECT: (continued)

Ways in which it differs from similar or previous programs:

1. It's student directed instead of teacher directed.
2. It puts more emphasis on student discovery than teacher explanation.
3. It encompasses topics in modern mathematics and takes into consideration the pattern of development of mathematical concepts of the children.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

The First Report of Elementary School Mathematics Curriculum Development Project (Aug. 1974 - Jan. 1975)

PRESENT COMMERCIAL AFFILIATIONS:

Taiwan Provincial Institute for Elementary School Teacher's In-service Education

MATERIALS AVAILABLE FREE: First Report of ESMCD.

ADDITIONAL MATERIALS BEING DEVELOPED:

Materials in preparation for publication:

1. The first two volumes of Math. Textbook, teacher's manuals for the first grade to appear May 1976.
2. Volumes of Math. Textbook (plus teacher's manuals) for the second to sixth grades to appear in the following months. The last two volumes will appear in Aug, 1977.
3. Six volumes of supplementary books for teachers (to appear in May 1976).

TEACHER PREPARATION:

Consultant Services: Advisory consulting team for elementary school teachers.

Pre-service and In-service Training:

1. In-service training at Taiwan Provincial Institute for Elementary School Teachers' In-service Education.
2. A Mathematics workshop was held with the purpose of selecting 8 excellent teachers to join the project.
3. There will be a seminar for Professors from Elementary School Teachers Junior Colleges in June 1976, to discuss how to include in the pre-service training programs, the materials produced by this project.

PROJECT EVALUATED:

Yes ____ No __X__ Internal ____ External Agency ____

PROJECT PUBLICITY:

The first report of Elementary School Math. Curriculum Development Project.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE:

1. To continue the compilation of the teaching materials from grades 1-6.
2. To design and manufacture teaching aids.
3. Having compiled the teaching materials, trial teaching in the pilot schools will be conducted.

ELEMENTARY SCIENCE CURRICULUM DEVELOPMENT PROJECT (ESCD)

Mason Chen
Taiwan Provincial Institute for Elementary
School Teachers' Inservice Education
30 Ta Kwan Road
Pan-Chiao, Taipei Hsien
Taiwan, REPUBLIC OF CHINA

Telephone: Not given

Director: Chu-Sheng Yeh Cheng

Project Duration: 1971-1977

Additional information, see also
Clearinghouse Reports: 9

Age: 6-11
Ability: all
Subject: biol, chem, phys, earth-space
Language: Chinese
Translations: none
Testing of Students: lab performance tests, teacher judgments, student attitude q're, interest inventories

Materials Developed by Project:

Print	Non-Print
Textbooks	Slides
Lab Books	Filmstrips
Supplementary Books	Games
Programmed Units	Lab Equipment
Activity Sheets	
Tchr. Manuals	
Field Guides	
Eval. Materials	

Types of Learning Experiences:

- Lecture
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Demonstrations
- Televised Lessons
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

C. S. Lin, Psychologist

PROJECT HISTORY:

Principal Initiator(s): Chu-Sheng Yeh Cheng

Reason(s) for Project Initiation: Change in the philosophy of education and development of new science course.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop a science curriculum for the primary school as a part of the compulsory National curriculum in general education.

Specific Objectives: 1) To produce new syllabi for science courses; 2) To develop instructional materials (textbooks, teacher's guides and aids); and 3) To train science teachers through short-term in-service training programs.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All elementary students, ages 6-11.

Ways in which it differs from similar or previous programs:

1. For average school children
2. It is experimental

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Elementary School Science Text I	Free	ESCD
Elementary School Science Teacher's Guide I	Free	ESCD
Elementary School Science Text II	Free	ESCD
Elementary School Science Teacher's Guide II	Free	ESCD
Elementary School Science Text III	Free	ESCD
Elementary School Science Teacher's Guide III	Free	ESCD
Elementary School Science Text IV	Free	ESCD
Elementary School Science Teacher's Guide IV	Free	ESCD

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: All those listed under Materials Already Produced above

ESCD (2)

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION:

Consultant Services: Advisory supervision team

Pre-service and In-service Training: 1) Short term mathematics workshop, and 2) In-service institute. They are financed by the Ministry of Education, National Science Council, and Taiwan Provincial Bureau of Education. Cost: NT$7,218,000

PROJECT EVALUATED:

Yes _____ No _____ Internal __X__ External Agency _____

Pertinent Research Studies: Reports on the Elementary School Science Curriculum Development Study.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT:

1. Advisory supervision of teachers in pilot school
2. Members' meetings every week
3. Evaluation meetings held regularly

PLANS FOR THE FUTURE:

The experimental textbook will be used as the national textbook for all elementary schools.

IMPROVEMENT OF EVALUATION IN SCIENCE TEACHING (IEIST)

Science Education Center
National Taiwan Normal University
Sect. 5 No:88 Roosevelt Road
Taipei, REPUBLIC OF CHINA

Telephone: 932-0204

Director: Kuan-Jen Yang

Project Duration: 1974-1977

Age: 12-14
Ability: average
Subject: biol, chem, phys, math
Language: Chinese
Translations: None
Testing of Students: written achievement tests

Materials Developed by Project:

Print	Non-Print
Eval. Materials Behavioral Objectives	Lab Equipment

Types of Learning Experiences:
Lecture
Discussion

PRINCIPAL PROFESSIONAL STAFF:

K. J. Yang, Director, biology
C. C. Chao, physics and science education
M. C. Liu, biology
M. T. Wei, chemistry
S. L. Mao, physics
H. M. Kuo, physics
M. T. Chen, mathematics
C. K. Lee, mathematics
C. E. Wu, biology
Y. C. Peng, chemistry
C. H. Wang, chemistry

PROJECT HISTORY:

Principal Initiator(s): National Science Council, Republic of China

Reason(s) for Project Initiation: To improve the quality of science education and to update evaluation in science teaching.

Evolution and Development of the Project: The project was initiated by the National Science Council in 1974 and financed by the Ministry of Education.

An Evaluation Study Committee, consisting of 20 science educators and 24 junior high school teachers, was set up in the Science Education Center at the National Taiwan Normal University. Based on Bloom's classification of behavioral objectives, instruction objectives and test items for each chapter of the textbooks have been designed. Pre-testing of objective items was conducted in six junior high schools. The main statistical information gained from pre-testing was difficulty and discrimination indices. The materials developed from the Project were compiled into handbooks. So far eleven handbooks have been published and are in use by science teachers in junior high schools throughout the country.

Each handbook contains, in sequence:
(1) an introduction
(2) purpose and methods of achievement test
(3) classification of behavioral objectives
(4) how to write behavioral objectives
(5) how to construct objective test items
(6) how to analyze test items
(7) a list of behavioral objectives for each chapter
(8) a set of objective items for achievement test

PROJECT OBJECTIVES:

Overall Project Purpose: To improve evaluation in science teaching.

PROJECT OBJECTIVES: (continued)

Specific Objectives:

a) To help teachers write behavioral objectives
b) To help teachers construct objective items
c) To help teachers analyze test items
d) To compile handbooks for achievement tests in junior high school sciences and mathematics

UNIQUE CHARACTERISTICS OF THE PROJECT: Not Answered

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Handbook for Achievement Test in Mathematics I-IV	Free	Science Ed. Center
Handbook for Achievement Test in Chemistry I-III	Free	Science Ed. Center
Handbook for Achievement Test in Physics I-II	Free	Science Ed. Center
Handbook for Achievement Test in Biology I-II	Free	Science Ed. Center

PRESENT COMMERCIAL AFFILIATIONS:

Science Education Center
National Taiwan Normal University
Sect. 5 No. 88 Roosevelt Road
Taipei, Republic of China

MATERIALS AVAILABLE FREE: See Materials Already Produced, above.

ADDITIONAL MATERIALS BEING DEVELOPED: Not Answered

TEACHER PREPARATION:

Consultant Services: Service available direct from the Science Education Center, National Taiwan Normal University.

Pre-service and In-service Training: Two-day workshop for senior students of the University and one-day workshop for junior high school teachers. All activities are financed by the Ministry of Education, Republic of China.

Pre-service and In-service Teaching Materials: Handbook for Achievement Tests have been adopted by all teacher training institutes.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

PROJECT PUBLICITY:

The Ministry of Education, Republic of China, has recommended the Handbook For Achievement Tests for use by the science teachers of junior high schools.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not Applicable

PLANS FOR THE FUTURE:

To publish five more handbooks; to prepare a record card of achievement tests for students; to prepare Science Attitude Test, and to prepare Science Aptitude Test.

LOWER SECONDARY SCIENCE CURRICULUM DEVELOPMENT PROJECT (LSS)

Science Department
Institute of Education
Paterson Road
SINGAPORE 9

Telephone: IE - Ext. 21

Director: C. K. Cheah

Project Duration: 1970-

Additional information; see also Clearinghouse Reports: 9

Age: 13, 14
Ability: all
Subject: biol, chem, envir. ed, phys, soc. sci., values ed, eng/tech
Language: English
Translations: possibly Chinese in future
Testing of Students:
  written achievement tests
  lab performance tests
  teacher judgments
  student q're

Materials Developed by Project:

Print	Non-Print
Lab Books	Slides
Programmed Units	Filmstrips
Activity Sheets	Models
Tchr. Manuals	Lab Equipment
Eval. Materials (tests)	
Overview	
Newsletters	

Types of Learning Experiences:

- Lecture
- Seminar
- Discussions
- Independent Study
- Lab Activities
- Field Experiences
- Demonstrations
- Simulations
- Televised Lessons
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

Project Team: Practicing teachers, teacher educators

Consultants: Universities, Government Ministries, Singapore Science Center, Statutory Bodies

PROJECT HISTORY:

Principal Initiator(s): Ruth Wong, Science Teachers' Association, Singapore.

Reason(s) for Project Initiation:

1. To update content and methodology in science.
2. To grapple with environmental/social issues.

Evolution and Development of the Project: This is an indigenous project, which is eclectic with respect to choice of materials.

PROJECT OBJECTIVES:

Overall Project Purpose:

1. To update content and methodology in science and technology.
2. To introduce social/environmental issues.

Specific Objectives:

1. To provide a basic science foundation for all pupils in sec 1 and 2 (approximately grades 7-8). This includes those who may and those who may not pursue science beyond grade 8.
2. To develop in pupils scientific skills and attitudes.
3. To provide a science course which is both relevant and meaningful to the pupil in terms of a technological environment.
4. To enable the pupils to appreciate the humanistic aspects of science teaching.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: The whole population of students aged 13-14 of whom at least 70% could be described as culturally deprived.

Ways in which it differs from similar or previous programs: With respect to the Singapore Scene, the LSS Project could be said to be:

1. objective-centered with regards to needs of the child and the nation
2. interdisciplinary and integrated via common themes and approaches
3. stressing processes of scientific investigation
4. stressing technological aspects
5. stressing social/environmental aspects

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Teachers' Guides and Pupils' Worksheets on two LSS units: Exploring Science Structure of Matter	Free	LSS
Test Unit on Structure of Matter	Free	LSS
Filmstrips on: (notes available free) fuel gas production generation of electricity purification of Singapore's water supply	Not given	LSS
An annotated 35mm slide sequence on the changing environment of Singapore (notes available free)	Not given	LSS

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: See Materials Already Produced, Including Sources and Costs.

ADDITIONAL MATERIALS BEING DEVELOPED:

Completion of remaining LSS Units, accompanying test units.
Development of relevant instructional materials, handbook on LSS.

TEACHER PREPARATION:

Consultant Services:

1. Newsletter service
2. School visits by Project staff
3. Basic and supplementary inservice courses
4. a self-service library of LSS and other science materials
5. an emergency phone service

Pre-service and In-service Training: Activities are essentially multi-media/multi-dimensional with lectures, film-shows, discussion, field trips, apparatus, improvisation workshops, simulations, etc.

Pre-service and In-service Teaching Materials:

1. Teachers' Guides and Pupils' Worksheets
2. Equipment is generally simple and readily available in most Singapore schools
3. Improvisations of a few less readily available pieces of equipment covered in courses

LSS (3)

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Name of Outside Evaluators: Informal formative evaluation is carried out through Project Team members and teachers in trial schools.

Pertinent Research Studies: M. Ed thesis: "The Effects of Enrichment Activities on the Development of Scientific Interest and The Attainment of Scientific Concepts"

In-House or Unpublished Research: A case study of the "Structure of Matter" unit in a Singapore classroom.

Availability of Evaluative Data: Not available at this time.

PROJECT PUBLICITY:

1. 'The Lower Secondary Science Curriculum Development Project'
   Education in the Developing Countries of the Commonwealth - Research Register 1972-1975.
2. Paper EIA No 41 - 'Science Curriculum with Emphasis on The Lower Secondary School Level'
   (IEIA) Inventory of Educational Innovations in Asia
   (AECID) Asian Centre of Educational Innovation for Development, Bangkok, Thailand
3. Joint Paper by Messrs C.K. Cheah and C.H. Lee 'The Role of Social Biology and Its Implications for School Science Teaching'
   Special reference was made to the teaching of social biology at the lower secondary (middle school) level.
   AABE (Asian Association for Biological Education in Asia) Biennial Conference on 'Biology in Urban and Rural Areas of Asia'
   Singapore October 1974
4. Several Papers on The Lower Secondary Science Curriculum Development Project
   SCIENTAS - Bulletin of the Science Teachers Association of Singapore Vol 10 No 1 October 1975

PROJECT ACTIVITIES SINCE 1974 REPORT: Implementation on school level beginning January 1976; extensive teacher training program.

PLANS FOR THE FUTURE:

1. completion of written materials
2. instructional materials development
3. more extensive formative evaluation
4. more interaction on national, regional and international basis

THE PRIMARY PILOT PROJECT (PPP)

Senior Inspector of Schools
Ministry of Education
SINGAPORE 10

Director: Yeo Lai Cheng

Project Duration: 1971-

Age: 6-12
Ability: all
Subject: English, math, science
Language: English
Translations: none
Testing of Students: not answered

Materials Developed by Project

Print	Non-Print
Textbooks	Games
Lab Books	
Activity Sheets	
Behavioral Objectives	

Types of Learning Experiences:

Discussion
Lab Activities

PRINCIPAL PROFESSIONAL STAFF: Not answered

PROJECT HISTORY:

Principal Initiator(s): Yeo Lai Cheng

Reason(s) for Project Initiation: Population explosion resulting in classroom explosion, knowledge explosion resulting in curriculum explosion, technological explosion resulting in an ever-widening industrialization gap between developed and developing countries. Since English is a functional tool of science and technology, alternative methods should be tried out to teach it more effectively, if the technological gap is to be closed somewhat.

Evolution and Development of the Project: To meet the problem posed by the fact that students come to English medium school speaking a wide variety of languages, the project has designed and implemented, since January 1971, an experimental Primary Pilot Project to integrate the teaching of English, mathematics and science in some primary schools.

PROJECT OBJECTIVES:

Overall Project Purpose: To integrate the teaching of English, mathematics and science in primary schools by developing these three areas in parallel with the language units specially programmed to reinforce and support the other two subjects.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Ways in which it differs from similar or previous programs: This project integrates the teaching of English with the teaching of science and mathematics.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Games and Activities from Mathematics and Science	Not Given	PPP
Teaching Units for Reading/Writing	Not Given	PPP
Twelve Readers for each grade level	Not Given	PPP

PRESENT COMMERCIAL AFFILIATIONS: Not answered

MATERIALS AVAILABLE FREE: Not answered

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION: Not answered

PROJECT EVALUATED:

Yes X No _____ Internal X External Agency _____

In-House or Unpublished Research:

1. Evaluation of the students, their readiness, progress, etc. based on behavioral changes
2. Evaluation (Psychometric) of the overall project to determine if the Primary Pilot Project materials have in fact brought about the project's objectives as evidenced in behavioral changes.

PROJECT PUBLICITY:

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE: Not answered

THE INSTITUTE FOR PROMOTION OF TEACHING SCIENCE AND TECHNOLOGY (IPST)

924 Sukhumvit Road
Bangkok 11
THAILAND

Telephone: 924020-9

Acting Director: Sukhum Sritanyaratana

Project Duration: 1970-1979

Additional information, see also
Clearinghouse Reports: 9, 8

Age: 6-17
Ability: above average, average
Subject: biol, chem, phys, math
Language: Thai
Translations: none
Testing of Students: written achievement and standardized tests, teacher judgments, student attitude q're, interest inventories

Materials Developed by Project:

Print
- Textbooks
- Lab Books
- Supplementary Books
- Programmed Units
- Activity Sheets
- Tchr. Manuals
- Field Guides
- Eval. Materials
- Behavioral Objectives
- Overview
- Newsletters
- Charts

Non-Print
- Slides
- Filmstrips
- Films
- Overhead Trans.
- Videotape
- Slide Tape
- Models
- Lab Equipment

Types of Learning Experiences:
- Lecture
- Discussion
- Lab Activities
- Field Experiences
- Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Sukhum Sritanyaratana, Acting Director
Nida Sapianchai, Deputy Director
Gordon H. Aylward, UNESCO Adviser

PROJECT HISTORY:

Principal Initiator(s): Thai Government, UNDP/UNESCO

Reason(s) for Project Initiation: To promote development of modern science and mathematics curricula.

Evolution and Development of the Project:
1976 - Stage I Implementation for Grade 8 General Science, Grade 11 Chemistry, Physics, Biology, Physical Science
1977 - Stage II Implementation for Grade 9 General Science, Grade 12 Chemistry, Physics, Biology, Physical Science, Grade 11 Mathematics
1978 - Stage III Implementation for Grade 7 Mathematics, Grade 1 Mathematics, Grade 10 General Science, Grade 12 Mathematics

PROJECT OBJECTIVES:

Overall Project Purpose: To promote the development of modern science and mathematics curricula, and the teaching practices congruent with modern approaches to teaching and learning science and mathematics.

Specific Objectives:
1. The purpose of the project is to develop, trial, and implement new courses in Biology, Chemistry, Physics, General Science, Physical Science and Mathematics.
2. To produce a large group of students who can benefit from university science courses.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Academically minded students.

Ways in which it differs from similar or previous programs: One of the unique characteristics of IPST is the comprehensive series of design teams composed of personnel from the Ministry of Education, universities and teacher's training colleges, and from elementary and secondary school classrooms.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Textbooks and Teacher's Guides:	Not Given	Krusapha Press
For Mathematics Grade 1		
For Mathematics Grade 2		
For Mathematics Grade 5		
For Mathematics Book 1, Grade 8		
For Mathematics Book 2, Grade 8		
For Mathematics Book 1, Grade 11		
For Mathematics Book 2, Grade 11		
For Mathematics Book 3, Grade 12		
For Mathematics Book 4, Grade 12		
For General Science Book 1, Grade 8		
For General Science Book 2, Grade 8		
For General Science Book 3, Grade 9		
For General Science Book 4, Grade 9		
For Chemistry Book 1, Grade 11		
For Chemistry Book 2, Grade 11		
For Chemistry Book 3, Grade 12		
For Chemistry Book 4, Grade 12		
For Biology Book 1, Grade 11		
For Biology Book 2, Grade 12		
For Biology Book 3, Grade 12		
For Biology Book 4, Grade 12		
For Physics Book 1, Grade 11		
For Physics Book 2, Grade 11		
For Physics Book 3, Grade 12		
For Physics Book 4, Grade 12		
For Physical Science, Sun's Energy Module, Grade 11		
For Physical Science, World Mixtures Module, Grade 11		
For Physical Science, The Good Living Module, Grade 11		
For Physical Science, Light We See Module, Grade 11		
For Physical Science, Colourful World Module, Grade 11		
For Physical Science, Electricity and Home Appliances Module		
Student Reference Books:	Not Given	Krusapha Press
Production of Monosodium glutomate		
Production of Sodium hydropide		
Use of Framework Molecular Models		
Vectors Book 1		
Vectors Book 2		
Vectors Book 3		
Wave Motion Book 1		
Wave Book 2		
Graphs		
Density		
Program Instruction: "Mole"	Not Given	Krusapha Press
Teacher Training Materials:	Not Given	Krusapha Press
S. I. Units		
Safety in School Lab		
Use of Biology Equipment		
Slide and Specimen Production		
A Selected Bibliography of Biological Works in Thailand		
Teaching Hints for General Science		
Teaching Hints for Physical Science		
Chemistry Evaluation and Test Questions		
Biology Evaluation and Text Questions		
Physics Evaluation and Test Questions		

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (Continued)

Material	Cost	Source
Student Equipment:	Not Given	Ong Kan Kar, Raj Damnern Avenue, Bangkok
Mathematics Grade 1, 7 IPST designed items		
Mathematics Grade 2, 14 IPST designed items		
Mathematics Grade 5, 21 IPST designed items		
Mathematics Grade 8, 6 IPST designed items		
Mathematics Grades 11 and 12, 5 IPST designed items		
General Science Grade 8, 26 IPST designed items		
General Science Grade 9, Sets or items		
Chemistry Grade 11 and 12, 30 Sets or items		
Biology Grade 11, 26 Sets or items		
Biology Grade 12, 4 Sets or items		
Physics Grade 11, 41 Sets or items		
Physics Grade 12, 14 Sets or items		
Physical Science Grade 11, 34 Sets or items		

PRESENT COMMERCIAL AFFILIATIONS:

Publisher of Books: Ministry of Education
Printer/Distributer: Krusapha Press

MATERIALS AVAILABLE FREE: Brochure in English

ADDITIONAL MATERIALS BEING DEVELOPED:

Books to be implemented 1977-79. Extensive science equipment designing, school testing, and redesign has been integrated into the curriculum development process. The equipment has now passed through the industrial designers and is at present being produced on a large scale under IPST supervision. It is being manufactured and will be distributed and sold by the Teacher's Association's commercial enterprise at controlled low profit costs.

TEACHER PREPARATION:

Consultant Services: IPST Curriculum Design Teams, Trained Ministry Supervisors, IPST In-service Instructors.

Pre-service and In-service Training: In-service workshops for all science and mathematics teachers in Thailand. Government financed workshops for pre-service College and University staff. Government financed UNDP assisted.

Pre-service and In-service Teaching Materials: Videotapes of model lessons, slide tapes, audio filmstrips on pedagogy and lab skills. Supplied free to affiliated Institutes from Government/UNDP funds.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

In-House or Unpublished Research: Seven doctoral candidates who are undertaking degrees at overseas universities carry out research projects at IPST and return to overseas universities for completion of dissertations.

Availability of Evaluative Data: By the end of 1977 the research results will be available in professional journals and in dissertation abstracts.

PROJECT PUBLICITY:

AAAS, Science Education News; October 1973.
Curriculum Development in Thailand, R. T. White, W. L. Butts, Aust. Science Teacher 21, 3, 1975 p. 47-52.
Institute for Promotion of Teaching Science and Technology, A Case Study, ACEID. Unesco Regional Office of Education, Bangkok, Thailand. (in press)

PROJECT ACTIVITIES SINCE 1974 REPORT:

Since 1974, final editions of student texts, teachers' guides have been accepted by Ministry and are in press for June 1976 implementation in all Government schools for grade 11 and 12 Chemistry, Physics, Biology, Physical Science, grade 8 General Science (150 schools). Other implementations including grade 7, 8, 11 Mathematics will follow. Large scale production of science and mathematics equipment is underway assisted by Small Scale UNDP/UNIDO project. 13 Regional Centers have been established in Teacher Training Colleges throughout Thailand and in 1975 conducted 44 three-week in-service courses for 1,600 teachers. This work will continue through 1979.

PLANS FOR THE FUTURE:

UNDP support will phase out in 1977 when IPST will be merged into the new Ministry of Education's National Curriculum Development Centre. Further UNDP aid may be requested for this centre.

INTEGRATED SCIENCES AT THE INTERMEDIATE SCHOOLS IN THE ARAB STATES

Science Department
ALESCO
Dokki Square
Cairo, EGYPT

Director: M. S. Selim

Project Duration: 1975-

Age: 13-15
Ability: all
Subject: Integrated Sci.
Language: Arabic
Translations: none
Testing of Students:
written achievement tests,
lab. performance tests,
oral tests

Materials Developed by Project:

Print	Non-Print
Textbooks Tchr. Manuals	

Types of Learning Experiences:

Not answered

PRINCIPAL PROFESSIONAL STAFF:

Dr. Adly Kamel Farag, Expert ALECSO

PROJECT HISTORY:

Principal Initiator(s): ALECSO

Reason(s) for Project Initiation: Need in the Arab States for new science program.

Evolution and Development of the Project:

a. First Expert meeting - Alexandria 1975 for selecting integrated approach.
b. Second Expert meeting - Cairo 1976 for building curriculum for 7th, 8th an 9th grades.
c. Third Expert meeting - Doha - Katar 1976 for approving 7th grade student's textbook and teacher's manual.

PROJECT OBJECTIVES:

Overall Project Purpose: To improve the standard of teaching sciences at the intermediate schools in the Arab States.

Specific Objectives: To offer students integrated sciences based on man and his environment to help them to know their environment and to make the best use of environmental resources.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Intermediate school students (ages 13-15) in all Arab States.

Ways in which it differs from similar or previous programs: The General Sciences and Hygiene course used in the Arab States is primarily a combination of Biology, Chemistry, Physics Geology and Hygiene, offered in a traditional teaching method. Most of these curricula stress the acquisition of facts, and neglect the formation of interests, attitudes and values among students.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Book No. 1 - First expert meeting Alexandria - 1975	Free	ALESCO

PRESENT COMMERCIAL AFFILIATIONS:

ALECSO - Science Department
109 Tahrir St. Dokki Sq.
Giza Egypt

INTEGRATED SCIENCES AT THE INTERMEDIATE SCHOOLS
IN THE ARAB STATES (2)

MATERIALS AVAILABLE FREE: Book No. 1

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION: Not yet

PROJECT EVALUATED: Not answered

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE:

Editing and publishing student's textbooks and teacher's manual for 7th, 8th, and 9th grades.

PILOT PROJECT FOR BIOLOGY TEACHING AT THE SECONDARY SCHOOLS IN THE ARAB STATES

Director, Science Department
ALESCO
Dokki Square
Cairo, EGYPT

Director: M. S. Selim

Project Duration: 1972-

Age: 16-18
Ability: all
Subject: biol
Language: Arabic
Translations: English
Testing of Students:
written achievement tests, oral tests

Materials Developed by Project

Print	Non-Print
Textbooks	
Tchr. Manuals	
Eval. Materials	

Types of Learning Experiences:

Lecture
Discussion
Lab Activities

PRINCIPAL PROFESSIONAL STAFF:

Dr. Adly Kamel Farag, Expert-ALECSO

PROJECT HISTORY:

Principal Initiator(s): ALECSO

Reason(s) for Project Initiation: Need in the Arab States to improve secondary school biology teaching.

Evolution and Development of the Project: A series of curriculum workshops was held in a number of Arab States, including Libya, Jordan, Iraq, Egypt and Saudi Arabia. These expert meetings led to the production of a series of five books and a series of student textbooks for grades ten, eleven, and twelve.

PROJECT OBJECTIVES:

Overall Project Purpose: To improve the Standard of Biology Teaching in the secondary schools in the Arab States, as a starting step towards the improvement of science teaching in other educational stages in the Arab World.

Specific Objectives: To offer students the new biological facts which could help them to understand ways of developing their societies, making the best use of their environmental resources.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Secondary school students in all Arab States.

Ways in which it differs from similar or previous programs: The Biology curriculums used in the Arab States are mainly a gathering of facts, offered in a traditional teaching method. Most of these curriculums stress the acquisition of facts, and neglect the formation of interests, attitudes and values among students. The Pilot Project was directed to change these curriculums and to achieve the following aims:

To help students learn the concepts, facts, generalizations, principles and basic laws of Biology in a practical way.
To help students acquire the suitable interests.
To help students acquire the suitable attitudes and values.
To train students in the use of the scientific method of thinking.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Books published in Arabic: Project Series		
Book No. 1 - First expert meeting Cairo 1972	Out of Print	ALECSO
Book No. 2 - Comparative Study of Biology Curriculums used in the Arab States	Free "	"
Book No. 3 - Second expert meeting, Baghdad, Iraq 1973 (available in English translation)	"	"

PILOT PROJECT FOR BIOLOGY TEACHING AT THE SECONDARY SCHOOLS IN THE ARAB STATES (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material	Cost	Source
Book No. 4 - Third expert meeting - Amman - Jordan 1973 (available in English translation)	Free	ALECSO
Book No. 5 - Fourth expert meeting - Tripoli - Libya 1974 (available in English translation)	$3.00 for student	"
Textbooks:		
Student's textbooks for 10th, 11th, and 12th grades	3.00	"
Teacher's Manual for 10th grades	Free	"
Teachers training courses for 10, 11, grades	"	"

PRESENT COMMERCIAL AFFILIATIONS:

ALESCO Science Department
109 Tahrir Street
Dokki Square
Giza, Egypt

MATERIALS AVAILABLE FREE:

Series: Book 2 - 5
teacher's manual for 10th grade

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION:

Consultant Services: Expert meeting - Faculty of Science - University of Alexandria, July 1975. Discussion of consultant services to be used in implementing new curriculum.

Pre-service and In-service Training: In-Service teacher training:
1975 two Summer training courses - period one month for each
1976 four Summer training courses - period one month for each

PROJECT EVALUATED:

Yes X No _____ Internal ____ External Agency _____

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE:

a. Editing and publishing 12th grade Student's textbook
b. Editing and publishing 11th grade Teacher's Manual
c. Editing and publishing 12th grade Teacher's Manual
d. Editing and publishing a guide for evaluative techniques in Biology Teaching at secondary school level in the Arab States.
e. Workshop of experts for audio-visual aids in Biology Teaching 1977
f. Summer Supervisors training courses 1977.
g. Congress of Curriculum planners, and Biology Teaching experts, 1977.

EDUCATION DEPARTMENT OF WESTERN AUSTRALIA
LOWER SECONDARY SCIENCE PROJECT (LSS)

Secondary Science Curriculum Branch
8 Parliament Place
West Perth 6005
WESTERN AUSTRALIA

Telephone: 22 1677

Director: K. Betjeman

Project Duration: 1968-1976

Age: 13-15
Ability: all
Subject: biol, chem, phys, earth-space
Language: English
Translations: none
Testing of Students: written achievement and lab performance tests; student assignment work, teacher judgments

Materials Developed by Project:

Print
Supplementary Books
Programmed Units
Activity Sheets
Tchr. Manuals
Eval. Materials
Behavioral Objectives
Overview
Newsletters
Charts

Non-Print
Lab Equipment

Types of Learning Experiences:

Lab Activities
Lecture
Demonstration
Discussion
Independent Study
Field Experiences
Televised Lessons
Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

Mr. K. Betjeman, Science Superintendent
Education Department of Western Australia
Construction House
Havelock Street
West Perth, Western Australia 6005

PROJECT HISTORY:

Principal Initiator(s): Dr. R. Vickery

Reason(s) for Project Initiation: Cessation of external examinations requirement for 'Junior Certificate' - Year 10. (Re-evaluation of objectives of education years 8-10 - ages 13-15.)

Evolution and Development of the Project: Introduction of 'Achievement Certificate' for years 8, 9 and 10. Student achievement to be measured by schools (moderated state-wide by the 'Board of Secondary Education', who also awards the certificates). Students to work at either 'Advanced', 'Intermediate' or 'Basic' level, such that they can 'succeed' while also being challenged. Twenty-one schools trialled course in 1969, most others started in 1970.

PROJECT OBJECTIVES:

Overall Project Purpose: To produce a course leading to the Achievement Certificate which was introduced in all schools of the Education Department of Western Australia in 1970. Extensive teacher's guides and related materials have been prepared in each subject by teachers seconded to Curriculum Branch. It is anticipated that schools and individual teachers will use these guides as a bank of resource materials to assist in designing learning experiences for their students.

Specific Objectives:

1. Students should be taught scientific procedures such as observing, organizing information, formulating theories, designing and carrying out controlled experiments, measuring, manipulating equipment and communicating and evaluating information.
2. Students should be given an introduction to the present state of knowledge in the major science disciplines of astronomy, biology, chemistry, geology and physics. The emphasis should be placed on major unifying concepts and their application to the child's environment.
3. Students should develop an attitude of inquiry, a willingness to suspend judgment and to consider new evidence, and a tolerance of the view of others.

PROJECT OBJECTIVES: (Continued)

Specific Objectives: (Continued)

4. Students should develop an appreciation of the tentative nature of scientific theories, an awareness of the impact of science on society and appreciation of contributions made by scientists.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: State population of Western Australia (with the exception of the handicapped) years 8, 9, and 10. (Ages 13, 14, and 15 years)

Ways in which it differs from similar projects or previous programs: Comparability tests are available and item banks are being developed to assist schools in the establishment and maintenance of standards and to provide an objective yardstick against which the comparability between different schools can be assessed. They are supplied by the Board of Secondary Education. Information concerning these tests is forwarded to schools each year.

Each school receives a print-out listing the number and percentage of its students achieving in the top quartile (advanced level), the middle two quartiles (intermediate level) and the lowest quartile (basic level) of the State population.

Comparability tests should not be used in the same way as the Junior Certificate was used. It does not represent an external examination which can be used to assess an individual student. Its main function is to check comparability between schools, not to check comparability between students. While individual student's comparability marks may be of some use in grading students, they should only be used in conjunction with the teachers' own marks for that subject.

The comparability tests should not determine the course taught in the school. Schools should plan their course first and then decide if the comparability tests are applicable.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

	Cost	Source
Materials listed are available free to Western Australian Secondary Schools. For interstate and overseas: materials are available for inspection only.	Not Given	LSS

First Year (Year 8):
Teachers' Guides: Magnetism, Living Things, Air Pressure, Chemistry, Plants, Fire, Mechanics, Animals, Geology.
Worksheets: Chemistry, Plants, Fire, Mechanics, Animals, Geology.
Resource Materials: Micro-Numbers

Second Year (Year 9):
Teachers' Guides: First Term, Second Term, and Third Term
Worksheets: Heat, Insects, Liquids, Electricity, Vertebrates, Atmosphere, Flowering Plants, Chemistry II.
Resource Materials: Thermograph Cards, Pressure Cards, Weather Map No. 1, Weather Map No. 2, Sequential Weather Map, Weather Maps with Fronts, Barographs, Biology Resource Book.

Third Year (Year 10):
Teachers' Guides: First Term, Second Term, and Third Term
Worksheets: Astronomy, Ecology, Light I, Light II, Genetics, Nuclear Energy, Sound

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (Continued)

Material

Third Year (Year 10): (continued)
Resource Materials: Angle Measurers, Astronomy Resource Book, Light Resource Book, Drag Strips

Research Topics:
People and How They Vary (Workbook and Teachers' Guide)
Consumer Science (Workbook and Teachers' Guide)
Case Studies (Workbook and Teachers' Guide)
Soil Studies (Workbook and Teachers' Guide)
Metal Jewellery (Workbook and Teachers' Guide)

Alternative Topics:
Biology of Man (Workbook and Teachers' Guide)
Safety with Electricity (Workbook and Teachers' Guide)

Programmed Topics Advanced Level:
Introductory Chemistry (Textbook, Record Book, Cards, and Teachers' Guide)
Chemistry 2 (Workbook, Answer Book, and Teachers' Guide)
Chemical Calculations I (Workbook, Answer Book, and Teachers' Guide)
Chemical Calculations II (Workbook, Cards, and Teachers' Guide)
Descriptive Chemistry (Workbook, Tape, and Teachers' Guide)
Energy (Workbook, Answer Book, and Teachers' Guide)
Motion (Answer Book, Workbook, and Teachers' Guide)
Sight and Sound (Workbook, Cards, and Teachers' Guide)

PRESENT COMMERCIAL AFFILIATIONS:

None. Published by Western Australia Government Printer.

MATERIALS AVAILABLE FREE:

All materials available free to Western Australian Secondary Schools. For interstate and overseas: inspection materials only are available. Class sets may be available subject to negotiation. Price on application only.

ADDITIONAL MATERIALS BEING DEVELOPED:

Revision and Metrication of LSS Materials on-going.

TEACHER PREPARATION:

Consultant Services: Advisory staff, superintendent visits, curriculum consultants, annual in-service program. The curriculum branch provides assistance in the areas of: course requirements, LSS topic supplies, reference materials, science methods, stock sheets, texts, and topic tests. A technical officer provides assistance in the areas of equipment, chemicals, and their care.

Pre-service and In-service Training: 'Science Education Seminars 1976' - A series of in-service workshops in various areas of science and education. Also, Annual Conference of Science Senior Masters and various in-service courses according to need, both financed by the Education Department of Western Australia and/or the Australian Schools Commission.

Pre-service and In-service Teaching Materials: Introduction to Teachers - Course Outline, various Teachers' Guides, 'Science Handbook', 'Filter' - a paper for Science Teachers (all available from the Education Department of Western Australia and free to Western Australia Secondary Schools).

LSS (4)

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

NEW SOUTH WALES JUNIOR SCIENCE INSERVICE PROJECT

15 Somerset Avenue
North Turramurra
N.S.W. AUSTRALIA
2074

Director: A. J. Watson

Project Duration: 1973-1975

Age: adult
Ability: teachers
Subject: integrated science
Language: English
Translations: none
Testing of Students: teacher education modules

Materials Developed by Project:

Print
- Programmed Units
- Field Guides
- Behavioral Objectives
- Overview
- Newsletters

Non-Print
- Slides
- Filmstrips
- Overhead Trans.
- Videotape
- Slide Tape
- Audiotape
- Role Play

Types of Learning Experiences:
- Discussion Groups

PRINCIPAL PROFESSIONAL STAFF:

A. Hukins, J. Hawes, M. Hough, Dianne Parkes

PROJECT HISTORY:

Principal Initiator(s): H. K. Carey

Reason(s) for Project Initiation: Introduction of a new science syllabus

Evolution and Development of the Project:

1. Objectives were formulated
2. Materials were developed and tested and revised
3. 1976 materials in their final form were released

PROJECT OBJECTIVES:

Overall Project Purpose: To assist individual teachers and science staffs to make decisions on the junior science course relevant to their own schools.

Specific Objectives:

1. To stimulate participants to critically examine the aims statement of the syllabus.
2. To assist teachers in developing a set of criteria relevant to the syllabus which can be used to develop a teaching sequence.
3. To increase the participant's understanding of things which ought to be considered when teacher is designing assessment procedures.
4. To provide participants with an appreciation of the things to be considered when reviewing or restructuring their science department organization.
5. To introduce the participants to guidelines for selecting appropriate teaching techniques.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Teachers in New South Wales using the new junior science syllabus.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
1. Module 1.0 - Aims and content	Free to teachers in New South Wales	Inservice Educ. P.O. Box 415 No. Sydney 2060 Australia
2. Module 1.1 - Aims		
3. Module 2.0 - Establishing Criteria for Developing a Teaching Sequence		
4. Module 2.1 - Developing Your Teaching Sequence		
5. Module 2.2 - Selecting Resource Material		
6. Module 3.0 - Establishing Guidelines for Making Assessments		

NEW SOUTH WALES JUNIOR SCIENCE INSERVICE PROJECT (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material

7. Module 3.1 - Assessing Knowledge and Skills
8. Module 3.2 - Assessing Interests and Attitudes
9. Module 3.3 - Establishing Consistent Assessment Procedures
10. Module 3.4 - Developing an Assessment Scheme
11. Module 4.0 - Establishing Guidelines for organizing a science department
12. Module 4.1 - Developing Staff Teamwork
13. Module 4.2 - Keeping Records of Student Achievement
14. Module 5.0 - Establishing Guidelines for Selecting appropriate Teaching Techniques
15. Module 5.1 - Selection of Appropriate Teaching Techniques

PRESENT COMMERCIAL AFFILIATIONS: Not answered

MATERIALS AVAILABLE FREE:

All materials free to teachers in New South Wales.

ADDITIONAL MATERIALS BEING DEVELOPED:

Two additional modules to the initial project are now in an early stage of development.

TEACHER PREPARATION:

Consultant Services: Regional Science Advisers on a one day per week basis are available. Each adviser services approximately 300 science teachers.

PROJECT EVALUATED:

Yes _____ No __X__ Internal _____ External Agency _____

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE:

Two modules are to be developed in 1976 on "Developing a Science Programme"

PHYSICAL SCIENCE - MAN AND THE PHYSICAL WORLD

HSC Physical Science Project
Education Faculty
Monash University
Clayton, Victoria 3168
AUSTRALIA

Telephone: 5410811

Director: Peter Fensham

Project Duration: 1974-1976

Age: 16-17
Ability: average
Subject: physical science chemistry, physics
Language: English
Translations: none
Testing of Students: not answered

Materials Developed by Project:

Print	Non-Print
Activity Sheets Tchr. Manuals Overview of Project Newsletters	not answered

Types of Learning Experiences:

Discussion
Lab Activities
Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

George Wright - Project Officer

PROJECT HISTORY:

Principal Initiator(s): V.U.S.E.B. Science Standing Committee, Chairman, Peter Fensham.

Reason(s) for Project Initiation: Final year of school science is heavily conditioned by University requirements. There is a drop off in numbers taking Physics and Chemistry. Existing Physics/Chemistry courses lack emphasis on technological and social aspects of science.

Evolution and Development of the Project: A grant of $30,000 from the Curriculum Development Centre in Canberra employed three people full time from May, 1975 for one full term. One of these people continues full time on the project until the end of 1976.

PROJECT OBJECTIVES:

Overall Project Purpose: To design and have approved for University entry a single physical science subject covering areas of physics and chemistry and emphasizing technological and social aspects of these sciences.

Specific Objectives:

The subject consists of 3 core units:

C.1 Change and Interaction covering changes in motion, chemical change and technological innovation and social change.
E.1 Energy Transformation attempting to develop an abstract view of energy in chemical and physical systems as opposed to a view of energy as a "fluid".
M.1 Useful Materials designed to investigate the property/structure relationship of materials, polymers, metals, ceramics, wood.

Students are required to take two options one of which may be internally examined. Some options are:

C.2 Chemical Change
E.2 Waves Sound and Music
E.3 Electrical Energy
E.4 Engines and Fuels
M.2 Carbon Based Materials
M.3 Water and Other Liquids

PHYSICAL SCIENCE - MAN AND THE PHYSICAL WORLD (2)

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Expected to appeal to average level 6th form students (aged 16-17) interested in science but not necessarily in University Physics/Chemistry. The Universities at this stage are prepared to view the subject as sufficient for entry into science faculties.

Ways in which it differs from similar or previous programs:

1. Module approach.
2. Options including internally examined option.
3. Combination Physics/Chemistry.
4. Emphasis on Applied Science.
5. Emphasis on social problems of Technology.
6. Emphasis on Technology of the Future.
7. De-emphasis of sophisticated mathematical treatment of topics.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Rationale and Background Document.	Not Given	Available in 1977 from V.U.S.E.B., 437 St. Kilda Rd., MELBOURNE. 3006 under the title "Phys. Sci.-Man & the Phys. World"
Curriculum Description		
Notes and References on the following Units - draft editions		
a. Change and Interaction C.1		
b. Energy Transformations E.1		
c. Useful Materials M.1		
d. Electrical Energy E.3 (Electronics)		
e. Waves, Sound and Music E.2		
Others in preparation.		

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: Not answered

ADDITIONAL MATERIALS BEING DEVELOPED:

The subject will be offered in schools for the first time in 1977. We expect about 30 classes to be taking it, using first editions of the materials. These materials are expected to be revised in the light of the first year experience.

TEACHER PREPARATION:

Pre-service and In-service Training: Three In-service 2 day sessions will be held during 1976 for teachers planning to teach the subject in 1977.

PROJECT EVALUATED: Not answered

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

PRIMARY SCIENCE SCHEME OF THE TERRITORY (PSST)

Commonwealth Department of Education
Northern Territory Division
Alice Springs Regional Office
P.O. Box 1420
Alice Springs, N.T.
AUSTRALIA 5750

Telephone: 52 3077

Director: John D. Edwards

Project Duration: 1975-1977

Age: 5-11
Ability: all except very slow learners
Subject: general sci.
Language: English
Translations: none
Testing of Students: not yet determined

Materials Developed by Project:

Print	Non-Print
Tchr. Manuals Equipment/Materials Catalog Vocabulary Lists Tchr. Material Resource Catalog	

Types of Learning Experiences: wide variety of experiences

PRINCIPAL PROFESSIONAL STAFF:

Professional staff includes members of the Northern Territory (N.T.) Curriculum and Research Branch of the Commonwealth Department of Education, Northern Territory Division, and a committee of 18 teachers.

PROJECT HISTORY:

Principal Initiator(s): John D. Edwards in conjunction with the N.T. Curriculum and Research Branch.

Reason(s) for Project Initiation: To provide teachers in the Northern Territory with a set of primary science guidelines.

Evolution and Development of the Project: The project started in mid 1974 with a submission to the Department's Curriculum and Research Branch which proposed that a set of primary science guidelines be developed for the Territory. In 1975 a number of primary schools selected and trialled several commercially available science programs. As a result of these trials, material resources were selected for inclusion in a set of teacher guides. These guides, the PSST Teacher's guides, were published in January 1976 and are now being formally trialled in eight Territory primary schools.

PROJECT OBJECTIVES:

Overall Project Purpose: To provide an alternative primary science program for the schools of the Northern Territory.

Specific Objectives: To provide a curriculum framework that schools can use to develop a primary science program; to provide a list of book and non-book material that teachers can use to achieve continuity of program over seven levels of primary science education; and to provide in-service education on matters relating to primary science program implementation and teaching.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: The PSST program is designed for all primary school students (age 5-11) except individuals with severe learning problems. The Northern Territory school population is multi-cultural and has a large proportion of Aboriginal children.

UNIQUE CHARACTERISTICS OF THE PROJECT: (continued)

Ways in which it differs from similar or previous programs: The PSST program is unique in that it provides for an orderly progression of science concepts and skills by using many different materials from several commercially available science programs. At any given level (grade) the teacher is provided with detailed references of "relevant" material from ESS, SCIS, CIS, Science 5/13, and several hundred 16 mm films and film strips. The curriculum framework into which these materials have been referenced is from Brandwein's Concepts in Science, Newton Edition. The obvious advantage in organizing a program in this way is that it provides for continuity of concepts and skill development, without tying the teacher to a prescribed content or methodology. The PSST guides are designed to avoid repetition of student units of work, from level to level, and to encourage the teacher to use resources from all of the listed programs as well as to develop their own work units. The program has the design flexibility to be taught by lock step or by individual progression, with as much or as little equipment as is on hand, by a specialist or by a non-specialist teacher, as a separate subject or in an integrated program, and from book or non-book material.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
PSST Teacher's Guides, Trial Editions; Levels I-VII	not purchasable	
Science Vocabulary (word usage) Lists for each of the seven levels of PSST Teacher's Guides	not purchasable	
Primary Science Consumable - Non-Consumable Materials Catalogue	not purchasable	
Recommended Science Library Resource Materials for Teachers in N.T. Primary Schools	not purchasable	

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE:

None, however, some of the materials may become available in 1977.

ADDITIONAL MATERIALS BEING DEVELOPED:

None at present. However, depending upon the outcome of this year's PSST trial program, the project is considering the development of a series of equipment and material kits for use in schools and by the N.T. School of Air.

TEACHER PREPARATION:

Consultant Services: A consultant service is available to any teacher who is using materials recommended in PSST or in the PSST Teacher's Guide books.

Pre-service and In-service Training: All PSST in-service programs are designed: to introduce teachers to the types of materials recommended in PSST; to provide teachers with information on implementation procedures and classroom management of PSST; to assist teachers in the development of science teaching methodology. To date, 15 conferences have been held. Two of these have been conducted in regional conference centers and the remaining 13 have been in schools. The Northern Territory Department of Education C&R Branch has provided funds.

TEACHER PREPARATION: (continued)

Pre-service and In-service Teaching Materials: All materials used in in-service work is available through publishers. These include text, reference books, films, teacher's guides, kits equipment, catalogues, and reviews.

PROJECT EVALUATED:

Yes _____ No X Internal _____ External Agency _____

Pertinent Research Studies: None

In-House or Unpublished Research: None

PROJECT PUBLICITY:

The project has been informally discussed and/or presented at several interstate conferences. The reports of the conferences are scheduled to be published in mid 1976.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not Applicable

PLANS FOR THE FUTURE:

A major PSST re-write session is planned in late 1976 or early 1977. Collecting data on implementation of PSST is scheduled to begin in June 1976.

BASIC SCIENCE, PHYSICAL SCIENCE, BIOLOGICAL SCIENCE

Curriculum Development Unit
Ministry of Education, Youth
and Sport
Suva, FIJI

Telephone: 312 877

Director: S. L. Achal

Project Duration: 1970-

Age: 11-16
Ability: all
Subject: biol, chem, phys, earth-space, soc. science
Language: English
Translations: none
Testing of Students:
written achievement tests
teacher judgments

Materials Developed by Project:

Print
- Lab Books
- Supplementary Books
- Programmed Units
- Activity Sheets
- Tchr. Manuals
- Eval. Materials (tests)
- Behavioral Objectives
- Newsletters
- Charts

Non-Print
- Slides
- Models
- Lab Equipment

Types of Learning Experiences:
- Lecture
- Seminar
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Demonstrations
- Simulations
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

S. Achal, Curriculum Developer, Advisor: Basic Science
S. Kaliyappan, Curriculum Developer, Advisor: Physical Science
P. Maharay, Curriculum Developer, Advisor: Biological Science

PROJECT HISTORY:

Principal Initiator(s): For Basic Science: UNDP/UNESCO
For Physical and Biological Science: Fiji Government, Ministry of Education.

Reason(s) for Project Initiation:

1. To integrate the sciences.
2. To make sciences relevant to Fiji.
3. To allow for use of locally made materials.
4. To upgrade methods of science teaching.

Evolution and Development of the Project:

The Basic Science course was first introduced on a trial basis in Form 1 in 1970. The course was very similar to the one written by John Ryding for W. Samoa. The course has since been revised, trialled, and extended to forms 2, 3 and 4. In March 1974 at a meeting of regional Directors of Education held at Honiara, it was proposed that a new Form 5 science program be constructed, consisting of physical and biological science.

PROJECT OBJECTIVES:

Overall Project Purpose:

For Basic Science: To give a good all around terminal course for the student likely to terminate education at Form 4. To give the student likely to continue on to Physical Science and Biological Science a satisfactory foundation.

For Physical Science and Biological Science: To develop scientifically literate individuals who can use relevant knowledge, concepts, skills, interests and attitudes in making every-day decisions. To prepare students for examinations at the end of Forms 5 and 6.

BASIC SCIENCE, PHYSICAL SCIENCE,
BIOLOGICAL SCIENCE (2)

PROJECT OBJECTIVES: (continued)

Specific Objectives: To give all students some idea of the methods of science, and of the power that scientific discoveries give to mankind. To give emphasis to basic concepts and active engagement in practical work. To design experimental work in such a way as to enable the work to be done with simple, inexpensive and unsophisticated apparatus. To improve knowledge and understanding, skills, and interests and attitudes in science.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All Fiji students aged 12-16 (forms 1-6) whether continuing with science education or terminating at these levels.

Ways in which it differs from similar or previous programs:

1. There were no local previous programs.
2. Fiji relied on United Kingdom and New Zealand for curriculum material, syllabi and testing. The materials from these countries emphasized their technology, their resources and the temperate climate. The local project emphasizes local technology and considers local resources.
3. It is therefore different from other similar projects in that it emphasizes the place of Fiji in the universe.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Form 1 - Grade 7:		
Teachers Guide	Available free to Fiji schools. Limited no. of sets available to others on request	Ministry of Ed., Youth & Sport, Suva, Fiji
Pupils Activity Cards		
Pupils Workbook		
Resource Books: Soap Readers; Equipment Techniques for Life Science; Life Science Reference Text and Dissection of a Toad		
Form 2 - Grade 8	"	"
Unit M-Measuring		
Unit N-Ordering		
Unit O-Separating Mixtures		
Unit P-Forces		
Unit Q-Heat		
Unit R-Light		
Unit S-Sound		
Unit T-Weather		
Unit U-Rocks		
Unit V-Food		
Form 3 - Grade 9	"	"
3.1 Use Your Senses		
3.2 Making Things Move		
3.3 Soap		
3.4 Metals		
3.5 Sources of Energy I		
3.6 Patterns		
3.7 Living Processes		
3.8 Signals		
Form 4 - Grade 10	"	"
4.1 Little Pieces		
4.2 Making Energy Work For Us		
4.3 Ships and the Sea		
4.4 The Earth's Resources		
4.5 Sources of Energy II		
3L3 Plant Needs		
4L2 Reproduction and Balance		
4L3 Man's Influence on Ecosystems		

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material	Cost	Source
Form 5 - Grade 11		
Biological Science Units	Available free to Fiji schools. Limited no. of sets available to others on request	Ministry of Ed., Youth & Sport, Suva, Fiji
Animal Maintenance Systems		
Movement and Coordination		
Green Plants		
Classification and Communities		
Ecosystems and Their Management		
Variation and Genetics		
Health and Disease		
Family Life		
Physical Science Units	"	"
Causing and Controlling Change		
Electricity		
Inside the Atom		
Water, Rocks and Soil		
Transportation		
Materials		

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: See Materials Already Produced, Including Sources and Costs

ADDITIONAL MATERIALS BEING DEVELOPED:

All Forms 4 and 5 materials are being revised. Some Resource Books are also to be written.

TEACHER PREPARATION:

Consultant Services:

1. In-service training prior to using the materials. Courses lasting from 1 to 6 weeks.
2. Visits by science advisers.
3. Advisory work through the mails.

Pre-service and In-service Training: In-service workshops, Pre-service: Liaison with the university and teachers' colleges. Supply material and present a few workshops.

Pre-service and In-service Teaching Materials: Generally only duplicated handouts, slide and slide tapes prepared by the advisers. All specialized equipment is prepared by the Educational Resources Centre of the Ministry of Education and is available to the schools and to the advisers.

PROJECT EVALUATED:

Yes _____ No X Internal _____ External Agency _____

Availability of Evaluative Data: Feedback from practicing teachers is used for revision of units, but is not available in a collated form. Evaluation is planned for 1977.

PROJECT PUBLICITY: Not answered.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered.

PLANS FOR THE FUTURE: Not answered.

PHYSICAL SCIENCE (FIJI OPTION) FOR NEW ZEALAND SCHOOL CERTIFICATE

Principal Education Officer (Science)
Ministry of Education, Youth and Sport
Curriculum Development Unit
SUVA, FIJI

Telephone: 312877

Director: Divakar Rao

Project Duration: 1974-

Age: 14, 15
Ability: average
Subject: physical science
Language: English
Translations: none
Testing of Students:
teacher judgments

Materials Developed by Project:

Print	Non-Print
Supplementary Books	Lab Equipment
Activity Sheets	
Tchr. Manuals	
Behavioral Objectives	
Overview	
Pupil's Workbooks	

Types of Learning Experiences:

- Lecture
- Discussion
- Seminar
- Independent Study
- Lab Activities
- Field Experiences
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

Mr. D. Rao, Chairman
Physical Science Committee

PROJECT HISTORY:

Principal Initiator(s): Physical Science Committee consisting of secondary teachers, Ministry officers and staff of tertiary institutions.

Reason(s) for Project Initiation: To provide an appropriate fifth form science course for students doing an integrated basic science course in fourth forms. This course and Biological Science course are two Fiji options for the New Zealand School Certificate Examination. Students sat their first exam in these subjects in 1975.

Evolution and Development of the Project: The project was started after Education Ministers met at Honiara in March 1974 and decided that a fifth form science course should be evolved which would be more relevant and meaningful to the students in the South Pacific. The first trial units on eight topics were produced within a span of nine months by individual writers. These units have now undergone extensive revision by curriculum specialists both from New Zealand and Fiji, after evaluation and feedback from trial teachers in 16 schools. In 1976, revised units are being used in the same 16 schools.

PROJECT OBJECTIVES:

Overall Project Purpose: The principal aim of this course is to develop scientifically literate individuals by helping them to use science knowledge and concepts, process skills and attitudes in making everyday decisions as they interact with other people and with their environment. This course reinforces and extends the work begun in the Forms 1 to 4 Basic Science course. The content and educational aims of the form 5 course also recognize the need to provide, on the one hand, for students who will advance to further science-related courses, and on the other, for students who will advance in other fields, or terminate their study at the form 5 level.

Specific Objectives: To achieve the above aim, the course is designed to: 1) develop attitudes of open-mindedness, intellectual honesty and critical inquiry; 2) encourage students to draw tentative conclusions on the basis of available evidence; 3) develop awareness and concern for their own environment with particular reference to the South Pacific Region; 4) develop an appreciation that applied science can cause economic, social and environmental change; 5) develop an awareness that scientific knowledge is tentative, subject to change as evidence accumulates; that science has its limitations and cannot explain all phenomena or solve all problems; 6) develop an interest and a continuing interest in the physi-

PROJECT OBJECTIVES: (Continued)

Specific Objectives: (continued)

cal sciences; 7) develop learning skills that will enable the student to continue to learn from his environment, and from reference sources; and 8) develop the ability to work with others, share ideas, and to recognize and appreciate the points of view of other people.

The course also aims to prepare students through content learned and understanding and skills developed, for further study in science-related courses.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: The course is aimed at Fifth Form students (ages 14-15) preparing for the New Zealand School Certificate. We have tried to pitch it at a level suitable for both the terminal and the on-going science student.

Ways in which it differs from similar or previous programs: In Fiji science has always been taught as individual subjects (physics, chemistry and biology) for Fifth Form students. Since 1975 two options have been offered: Physical Science and Biological Science. None of the South Pacific countries (including New Zealand) have experimented with this integrated approach. Therefore, it is a pioneering effort in this region. Topics have been dealt with thematically and content has been sacrificed for proper understanding of fundamental concepts.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material

The Physical Science Units listed below are produced by the project and are not for sale.

Causing and Controlling Change; Radiant Energy; Electricity; Inside the Atom; Water, Rocks and Soil; Transportation; Resource Management; and Materials.

Each of these units are undergoing extensive revision. Teacher's Guides have been written for the first three units and the others are in preparation.

PRESENT COMMERCIAL AFFILIATIONS:

Educational Resources Centre
Ministry of Education, Youth and Sport
SUVA, FIJI

MATERIALS AVAILABLE FREE:

Since the project has produced trial materials only, there has been limited publication. A few sample copies are available for inspection, however none of the material is for sale. Trial schools are provided materials free of charge.

ADDITIONAL MATERIALS BEING DEVELOPED:

Additional resource material for teachers, including background notes and suggestions for audio-visual aids.

TEACHER PREPARATION:

Consultant Services: There are four science advisers/curriculum writers in the Curriculum Development Unit who are available for consultation and who make regular visits to trial schools.

Pre-service and In-service Training: In the first year of trial three in-service courses for 25-30 teachers were held at the end of each term. The pre-service courses last two weeks and are held in Suva. The courses are financed entirely by the government.

Pre-service and In-service Teaching Materials: Use of materials at the School of Education, University of the South Pacific has kept costs to a minimum.

PHYSICAL SCIENCE (FIJI OPTION) FOR N.Z. SCHOOL CERTIFICATE (3)

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Pertinent Research Studies: Not applicable

In-House or Unpublished Research: Not applicable

Availability of Evaluative Data: Not available as yet

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE:

Streamlining of secondary science curriculum such that by 1980 all secondary schools will be offering Basic Science only in Forms 1-4 and the courses available in Fifth Forms from 1981 would be Physical Science and/or Biological Science. The idea is to phase out individual sciences in secondary schools up to Form 5 Level.

MATHEMATICS LEARNING PROJECT (MLP)

The Papua New Guinea University
of Technology
P. O. Box 793
Lae, PAPUA NEW GUINEA

Telephone: 42-4999

Director: Glen Lean

Project Duration: 1972-

Age: 17, 18, adult
Ability: above average
Subject: mathematics
Language: English
Translations: none
Testing of Students:
  written achievement tests
  lab performance tests

Materials Developed by Project:

Print	Non-Print
Programmed Units	Models
Activity Sheets	Lab Equipment
Eval. Materials (tests)	
Behavioral Objectives	

Types of Learning Experiences:
- Independent Study
- Lab Activities
- Field Experiences

PRINCIPAL PROFESSIONAL STAFF:

Dr. David Tombs, Executive Officer and Head of Mathematics Department at the Papua New Guinea University of Technology)

Mr. Duncan Rasmussen, Acting Director
Mr. Colin Meek, Curriculum Officer

PROJECT HISTORY:

Principal Initiator(s): Centre for Educational Development Overseas, U. K.

Vice Chancellor of the Papua New Guinea University of Technology, Lae.

Prof. S. S. Dunn, then Dean of Education, Monash University, Melbourne, Australia.

Reason(s) for Project Initiation: There is a great need to improve the standard of mathematics education among students at this University.

Evolution and Development of the Project: A pilot study by Professor Bajpai from the Loughborough University of Technology, U.K., for the Centre for Education Development Overseas was adopted by the University and supported by the Nuffield Foundation, The Ross Trust of Melbourne, Australia and other philanthropic bodies. A period of research into mathematics learning difficulties was followed by the implementation of a personalized system of instruction.

PROJECT OBJECTIVES:

Overall Project Purpose: To identify and eradicate problems associated with learning mathematics in secondary and tertiary students, particularly the latter, in Papua New Guinea.

Specific Objectives:

1. To support the staff of the Mathematics Department at the Papua New Guinea University of Technology in its implementation of a personalized system of instruction initiated by the Mathematics Learning Project.
2. Continue research into mathematics learning problems in Papua New Guinea.
3. Hold discussions with tertiary and secondary teachers of mathematics, and disseminate ideas on mathematics learning.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Tertiary students, particularly, those at the Papua New Guinea University of Technology, Lae.

UNIQUE CHARACTERISTICS OF THE PROJECT: (continued)

Ways in which it differs from similar or previous programs: The system abolishes lectures. Dissemination of information is dependent on highly interactive printed material through which the student works independently, or in small groups. Responses are continually required of the student and answers are continually supplied. Behavioral goals are stated at the beginning of each unit which is typically tested at the 100% mastery level. Students are also directed to perform practical laboratory and field tasks. The system is unique in Papua New Guinea.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
We are in the process of producing 117 units covering 12 courses in the first and second year. Of these, approximately 1/3 are complete or ready for printing. Many are based on the units which we produced and trialled last year when we introduced the system in the first year. Printed material for one unit is of the order of 40-50 pages.	Limited supplies avail. in quarterly installmts, K25.00 (A$25.00) for full set of units for one course (approx. 30 units)	MLP
Jones, Peter and Rasmussen, Duncan, Experience with a Personalized System of Instruction at the Papua New Guinea University of Technology. Mathematics Learning Project, Lae, 1975	Free	MLP
Progress Report, Mathematics Learning Project, Lae, 1975.	Free, Limited no.	MLP

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: See Materials Already Produced, Including Sources and Costs.

ADDITIONAL MATERIALS BEING DEVELOPED: Remainder of units described in Materials Already Produced, Including Sources and Costs

TEACHER PREPARATION:

Consultant Services: Within Papua New Guinea we conduct regular in-service seminars on our materials and on materials writing.

Pre-service and In-service Training: In 1975 a number of one to three day workshops were conducted by our officers. Costs were met jointly by the M.L.P. and schools.

There was also a continuous exchange between mathematics staff in the University and M.L.P. officers resulting in materials writing being almost entirely taken over by the mathematics staff by 1976.

Pre-service and In-service Teaching Materials: Experience with a Personalized System of Instruction at the Papua New Guinea University of Technology. A small publication, a limited number of which are available on application.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Pertinent Research Studies:

Lean, Glen An Investigation of Spatial Ability, in Progress Report, M.L.P. Lae, 1975 (as mentioned above).

Booth, Lesley Investigation of Teaching Methods, PNG Journal of Education

PROJECT EVALUATION: (continued)

In-House or Unpublished Research: Current research is centered on attempts to discover the cognitive development of our students based on Piaget's theory of cognitive development.

Availability of Evaluative Data: Evaluation is in terms of student response in the form of a questionnaire.

PROJECT PUBLICITY: Not answered.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered.

PLANS FOR THE FUTURE: Not answered.

SECONDARY SCIENCE PROJECT

Secretary of Education
Attn: Senior Curriculum Officer
Science Curriculum Unit
Ministry of Education
Konedobu, Papua
NEW GUINEA

Director: Brian Deutrom

Project Duration: 1971-

Age: 12-15
Ability: average
Subject: biol, chem, phys
Language: English
Translations: none
Testing of Students: not answered

Materials Developed by Project:

Print	Non-Print
Tchr. Manuals	33 mm slides
Textbooks	
Student Books	

Types of Learning Experiences:

PRINCIPAL PROFESSIONAL STAFF: P. E. Brian Deutrom and Michael Tapo

PROJECT HISTORY:

Principal Initiator(s): The government of Papua, New Guinea

Reason(s) for Project Initiation: To develop a science curriculum for Papua, New Guinea.

Evolution and Development of the Project: UNDP/UNESCO assisted with expert personnel as well as printshop facilities and technical personnel.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop a secondary science curriculum relevant to Papua New Guinea and to be taught to a large extent by Papua New Guineans to whom English is a second language.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students in grades 7-10 in Papua, New Guinea for whom English is not the native language.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
1. Teachers Guide, Forms I-II	Materials listed are not purchasable	
2. Pupils Readers Forms I-II		
3. Teachers Guides Form III (Pilot)		

PRESENT COMMERCIAL AFFILIATIONS: Not answered

MATERIALS AVAILABLE FREE:

Any material will be supplied if available to bona fide projects.

ADDITIONAL MATERIALS BEING DEVELOPED:

Teachers Guide Form IV
Sets of 35mm slides for Forms III and IV
Pupils Readers Forms III and IV

TEACHER PREPARATION:

Consultant Services: Senior Curriculum Officer and other members of the Syllabus Committee visit schools.

TEACHER PREPARATION: (continued)

Pre-service and In-service Training: Pre-service training: University of Papua New Guinea Goroka Teachers College. In-service: Vacation Lahara Courses conducted jointly by U.P.N.G. and Ministry of Education. Short Regional in-services courses.

Pre-service and In-service Teaching Materials: Teachers Guides

PROJECT EVALUATED:

In-House or Unpublished Research: All materials are piloted in schools, evaluated and then rewritten prior to final implementation.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT:

The final version of the Form II Teachers Guide has become available to all schools. Pupil Readers for Form II have been completed. The Pilot Edition of the Form III Teachers Guide is now in the schools undergoing evaluation while the Form IV Teachers Guide is in preparation for 1977.

PLANS FOR THE FUTURE:

Complete evaluation of Form III and IV trial material and rewriting of the final edition of the Teachers Guide for the forms. Re-evaluation of Forms I and II in light of the change of direction of secondary education in Papua New Guinea.

SOLOMON ISLANDS/UNESCO PRIMARY SCIENCE (SIEAS)

Solomon Islands Teachers College
P.O. Box 1
Honiara
Guadalcanal Island
SOLOMON ISLANDS

Telephone: 07:43107:42

Directors: G. H. Cannon, Levy Laka, and Patrick Hughes

Project Duration: 1971-1975

Additional information, see also Clearinghouse Reports: 9

Age: 5-13+
Ability: all
Subject: integrated science, envir. sci, biol, phys, earth-space, math
Language: English
Translations: none
Testing of Students: student attitude q're, science process tests

Materials Developed by Project:

Print	Non-Print
Programmed Units	Lab Equipment
Tchr. Manuals	

Types of Learning Experiences: Not answered

PRINCIPAL PROFESSIONAL STAFF:

G. H. Cannon, Professor of Education
Department of Science Education
University of British Columbia
2075 Wesbrook Place
Vancouver, B.C., CANADA
V6T 1W5

Levy Laka
Solomon Islands Teachers College
P.O. Box 1
Honiara
SOLOMON ISLANDS

Patrick J. Hughes
MAHE
Ministry of Education
SEYCHELE ISLANDS

PROJECT HISTORY:

Principal Initiator(s): UNICEF/UNESCO, Dr. G. H. Cannon

Evolution and Development of the Project:

In 1969 Dr. Edward Cruden and Mr. John Ryding of the University of the South Pacific (U.S.P.) came to the Solomon Islands on behalf of UNICEF/UNESCO to investigate a request from the Chief Secretary Western Pacific High Commissioner for assistance in the development of a Science Curriculum for Solomon Islands Senior Primary Schools.

In May 1971 Mr. P. J. Hughes was appointed the Local Project Officer, and a year later in July 1972 Dr. G. H. Cannon, Professor of Science Education of the University of British Columbia was appointed as UNESCO consultant for this project.

Dr. Cannon was asked to develop a curriculum for the whole range of the primary school from Std. 1-7, and not just Stds. V, VI & VII as was originally planned.

In December 1971 an in-service workshop was held at this College for over 150 trained teachers. This was the overall introductory Course to a new line of thinking in terms of science teaching in the primary schools. The project has taken five years to complete. The First Edition was completed in 1973. This was re-edited during 1974, when workshops/seminars were organized. The Second Edition, a draft script for the Third Edition, was completed in 1975. The Third Edition is still in press.

SIEAS (2)

PROJECT OBJECTIVES:

Specific Objectives: The goals or objectives of the project are: (1) To devise a curriculum in basic science for Standards I - VII which is appropriate to the Solomon Islands; (2) To provide suitable science teaching materials to the senior primary schools; (3) To train teachers in the methods and special techniques of science teaching and the organization of suitable pupil activities at this level; (4) To provide appropriate materials for this teacher training program; and (5) To produce a locally oriented environmental science curriculum instead of using an 'imported' science curriculum.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Ways in which it differs from similar or previous programs: Previous programs stressed 'Rote-Memorization' and were exam oriented/directed. The approach of this project includes the involvement of indigenous teachers in the planning and development of the program, through interviews, a weekly Curriculum Development Seminar, the pre-service program, in-service workshops, and classroom development of the units by the teachers. Thus the decision makers in the process are the indigenous teachers and the pupils in the classroom. The resulting curriculum should emerge from and be compatible with the culture.

With the proposed introduction of composite classes in 1975 the S.I.E.A.S. with its child-centered approach assumed a major role during the school day. The program has been instrumental in the adoption of a more child-centered approach in other subject areas. The activity format is such that teachers can write their own activities and/or units based on work done by the children in their classroom. This material is then edited by the project staff and published as a trial version.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Solomon Islands Environmental Approach to Science (SIEAS) Book 1 for Stds. 1 and 2	Not Given	SIEAS
S.I.E.A.S - Book II for Stds. 3 & 4	Not Given	SIEAS
S.I.E.A.S - Book III for Stds. 5 & 6	Not Given	SIEAS

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

1. Rural Science Project - Curriculum Development
2. Social Science Project - Curriculum Development

TEACHER PREPARATION:

Consultant Services: 1) Teachers in-service courses held during school vacations; 2) Up-grading of teachers courses; 3) Pre-service students--part of three-year teacher education program; and 4) Practicing teachers courses in the Islands outside the College.

Pre-service and In-service Training: District workshops in the Islands for in-service teachers. Financed by Ministry of Education--costs cover transport of teachers, catering, tutor fares by air.

Pre-service and In-service Teaching Materials: 1) Teaching materials are locally produced. The teacher is shown the skills to produce using local materials. The teacher becomes the producer; and 2) Other teaching materials that cannot be locally produced are supplied by UNESCO who finances this project.

PROJECT EVALUATED:

Yes _____ No __X__ Internal _____ External Agency _____

PROJECT PUBLICITY:

UNESCO Reports submitted to Paris Headquarters: June-August 1974, August 1972-May 1973, and June-August 1975.

PROJECT ACTIVITIES SINCE 1974 REPORT:

1. Re-editing of materials - June-August 1975. Produced second edition. (Draft copy for the third edition)
2. Third Edition now in press with photos included - due June 1976.
3. Initiation of Evaluation Tests for the project began June-August, 1975.

PLANS FOR THE FUTURE:

1. Production of Evaluation Tests to be continued this year.
2. Continue writing/editing locally produced materials.
3. Prepare tests in science education to evaluate the "Processes of Science" as a means of evaluating the UNESCO/UNICEF project.

CENTRE BELGE DE PEDAGOGIE DE LA MATHEMATIQUE (CBPM)

Avenue Albert, 224
B 1180 Brussels
BELGIUM

Telephone: 02/345 31 37

Directors: George Papy and J. Matthys

Project Duration: 1961-

Age: 5-adult
Ability: all
Subject: math
Language: English, French, Dutch
Translations: German, Spanish, Russian, Japanese, Romanian, Swedish, Vietnamese, Italian
Testing of Students: not answered

Materials Developed by Project:

Print	Non-Print
Textbooks	Overhead Trans. Games

Types of Learning Experiences: Not answered

PRINCIPAL PROFESSIONAL STAFF:

Papy, President
Holvoet, Vice-President
Matthys, Director

PROJECT HISTORY:

Principal Initiator(s): Gille, Bockstaele, Holvoet, Nachtergaele, Papy-Lenger, Papy, Sart, Servais, Wuytack.

Reason(s) for Project Initiation: To encourage and to stimulate a necessary renewal in the teaching of mathematics.

Evolution and Development of the Project: The CBPM was founded in 1961. In order to accomplish its goal of modernizing mathematics education CBPM works in various domains: Research in the methodology of mathematics, pedagogical experience and dissemination of information.

PROJECT OBJECTIVES:

Overall Project Purpose: The study, improvement and reform of the teaching of mathematics and the promotion, development and the diffusion of a new way to teach mathematics.

Specific Objectives: 1) to determine what are the actual bases of mathematics; 2) to determine the part of psycho-affective factors in the learning of mathematics; 3) to make clear what are the bases of a mathematical pedagogy; 4) to write mathematical texts for teachers and pupils; 5) to establish a canvas for a program for the teaching of mathematics; and 6) to organize and to coordinate pedagogical experiences for the teaching of modern mathematics.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: all ages and levels

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

The materials listed below are available from the publishers given. Cost of the materials was not given.

Materials for Primary School and Kindergarten:
L'enfant et les graphes by Frédérique, Papy, D. Incolle. Didier, Bruxelles, Paris, Montréal. (Translated in English: Graphs and Child. Algonquin Publishing, Education Nouvelle, Montréal.)

MATERIALS ALREADY PRODUCED: (Continued)

Materials for Primary School and Kindergarten: (continued)

Collection Les enfants et la mathématique (EM 1, EM 2, EM 3, EM 4, EM 5 and EM 6) by Frédérique. Didier, Bruxelles, Paris, Montréal. The English translation of EM 1 goes under the heading: Mathematics and the Child (MCh). Algonquin Publishing, Education Nouvelle, Montréal.

Cahiers de mathématique 1, 2, 3 by Frédérique, D. Incolle. Didier, Bruxelles, Paris, Montréal.

L'enfant de 4 ans et le langage des graphes by Frédérique, M.Th. Hoeymans. Hachette, Paris.

Graph games, A young math book by Frédérique, Papy. T. Y. Crowell Co., New York.

A Collection of Stories by Frédérique, Papy published by Hachette, Paris: Jeux de Nombres (Trans. German), Jeux de Groupes (Trans. German), Jeux de Graphes (Trans. German), Le jeu des chapeaux ou les surprises de l'infini (Trans. German, Italian), Au Cirque, Taximétrix, Premiers jeux de Nombres, Batailles de Nombres, Jeux binaires.

Another collection of stories by Frédérique, Papy published by Dorothy Novick, Comprehensive School Mathematics Program 3120 59th Street, St. Louis, MO 63139, U.S.A.
Don't be unhappy, Dancing Friends, Singing Friends, A very strange neighbourhood, Election in the number world, A Valentine mystery, 81 Roses, The little donkey, The old shoemaker, The hidden treasure, One out of seven, Two by Two, The new playground, The Jokester, The living lines, Equipollent, Navu wins an award, The happy puppet, I am not my name, Equipollence and parallel projection, Number 1000's dream, The little dreamer, How to become a number's friend, 37, The square trap.

Papy's Minicomputer (Children's material, Teacher's material, Manual for the teacher (French, Dutch, English). International Visual Aid Center (IVAC): Bruxelles. English translation of the Teacher's Manual: Teacher's guide Papy Minicomputer. The Collier-Macmillan Company, New York.

Collection Mathématique Moderne (MM) by Papy, Frédérique. Didier, Bruxelles, Paris, Montréal.

MM 1 Ensembles et relations (translated in English, Dutch, Spanish, Romanian, Japanese, Danish, Portugese, Russian, Vietnamese)
MM 2 Nombres réels et vectoriel plan (translated in Dutch, English, Spanish, Romanian, Danish)
MM 3 Voici Euclide ! (translated in Dutch, Spanish, Danish) Also, transparencies for MM 3: Isometries, Distances, Scalar Product, and Enegalities published by the International Visual Aids Center (IVAC).

MM 4 Fonctions reelles (in preparation)

MM 5 Arithmetique (translated in Dutch) and Combinatoire

MM 6 Geometrie plane

(The English translations are presented under the heading "Modern Mathematics" and published by Collier-Macmillan Ltd, London; The Macmillan Company, New York; and, Collier-Macmillan Canada Ltd, Toronto. Titles are: MM 1 Sets and relations; and MM 2 Real numbers and plane vector space.

Papy Collection Minimath (mm) by Papy, Debbaut and Capiaux. Didier, Bruxelles, Paris, Montréal.

MATERIALS ALREADY PRODUCED: (Continued)

Collection Frédérique (F) by Papy, with the collaboration of P. Debbaut and J. Cl. Matthys. Presses Universitaires de Bruxelles (PUB, Bruxelles).

- F 1 Géométrie affine plane et nombres réels
- F 2 Initiation aux espaces vectoriels
- F 3 Le premier enseignement de l'analyse
- F 4 Théorie des probabilities y compris l'analyse statistique
- F 5 Nombres et vectoriel plan réels

Calcul propositionnel et booléen

Arcs et cycles (in preparation)

Classes d'ensembles (in preparation)

Groupes, Presses Universitaires de Bruxelles, Bruxelles - Dunod, Paris (translated into English, Dutch, Italian). The English translation is entitled, Groups and published by Macmillan, London.

Groupoïdes, Labor, Bruxelles, PUF Paris. (Translated into German)

Publications of the CBPM

Premieres leçons d'analyse mathématique par Frédérique by Papy. Arlon 8.

Nouvelles lecons d'analyse mathématique par Frédérique by Papy. Arlon 9.

Une expérience pédagogique de 10 ans en Belgique by Papy with the collaboration of Brugraeve, Frédérique, Holvoet, Terfve. Arlon 10.

Notions de logique by J. Drabbe.

Entretiens d'algèbre by Papy.

Collection Mathématique pour l'homme libre: by Papy, Cedic, Paris.

Premiers ébats catégoriels (First categorical games). (preprint CBPM Brussels)

Du plan usuel à la topologie (From usual plane to topology). (preprint CBPM Brussels)

Ordre réel et continuité (Real order and continuity). (preprint CBPM Brussels)

La conique enfin laconique.

PRESENT COMMERCIAL AFFILIATIONS: See publishers listed under Materials Already Produced.

MATERIALS AVAILABLE FREE: Not answered

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION: Not answered

PROJECT EVALUATED: Not answered

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT:

General Topology, Theory of Categories, Theory of Probability.

PLANS FOR THE FUTURE: Not answered

ASK NATURE

Royal Danish School of Educational Studies
Physics Department
Emdrupvej 115B,
2400 Copenhagen, N. V.
DENMARK

Telephone: 01-696633 EXT. 324 or 325

Director: Poul Thomsen

Project Duration: 1972-1979

Age: 13-16
Ability: all
Subject: chem, phys
Language: Danish
Translations: none
Testing of Students:
written achievement test, lab performance tests, oral tests, teacher judgments

Materials Developed by Project:

Print	Non-Print
Lab Books	Lab Equipment
Programmed Units	
Tchr. Manuals	
Eval. Materials	
Overview	

Types of Learning Experiences:

- Discussion
- Independent Study
- Lab Activities
- Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Poul Hanghoj	Co-director
Karl Larsen	"
Ejvind Flensted-Jensen	"
Lars Engels	"
Peter Nomld	"

PROJECT HISTORY:

Principal Initiator(s): Poul Thomsen and Poul Hanghoj

Reason(s) for Project Initiation: A curriculum reform in the Danish Folk School (implemented August 1976).

Evolution and Development of the Project: The project was started in 1972 by Professor Poul Thomsen from the Royal Danish School of Educational Studies in Copenhagen, working together with three experienced Danish physics teachers: Poul Hanghoj (now inspector for the teaching of physics in the Danish Folk School), Vice-Headmaster Karl Larsen and Ejvind Flensted-Jensen.

In the Spring of 1973 the first preliminary edition of Ask Nature I was tested in 13 classes throughout the country. In the Autumn of 1973 a fully revised edition of Ask Nature 1 was tested in 32 classes, and in the Spring of 1974 a preliminary edition of Ask Nature 2 was tested in the same classes. At the same time the authors of Ask Nature 3 were running pilot courses in other classes.

In the school year 1974/75 commercial editions of Ask Nature 1 and 2 have been used in more than 200 classes and reactions from teachers have been very encouraging. A preliminary edition of Ask Nature 4 is going to be tested in the school year 1975/76.

Ask Nature 1 and 2 covers the syllabus for the first year in which physics is taught in Danish schools (students aged 14), 3 and 4 covers the next year, etc.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop a course to fulfill the aims in the new Danish Physics Curriculum for the Folk School requiring teaching of pupils of mixed ability.

Specific Objectives: Since about 1960 the pupils' own laboratory work has been playing an increasing role in the teaching of physics in Danish schools. But it has mostly been used as a supplement to the textbooks. And nearly all the textbooks have been of the type that gives all the answers.

ASK NATURE (2)

PROJECT OBJECTIVES:

Specific Objectives: (continued)
The name "Ask Nature" indicates that we are trying to make a new type of textbook in which theory and laboratory work are highly integrated, and which often just states a problem and encourages the pupils and teacher to solve problems by doing experiments, and in this way to let nature itself supply the answer.

Since PSSC gave rise to an explosive development of physics education in many countries, as well as in Denmark, many educational experiences and many new teaching methods were introduced. We try to incorporate many of these in the system as we find it adequate to make use of a variety of teaching methods and for each subject we choose the technique and method which we consider best under the circumstances. Sometimes the material is highly structured, at other times we allow the pupils to experiment almost freely.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Classes with pupils of mixed ability.

Ways in which it differs from similar or previous programs: More lab-centered, laborary problems, independent studies, self-checking programs fully integrated.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Ask Nature I: Practical Electricity (88 pages)	$3.00	Gyldendal
Ask Nature II: Matter and the Structure of Matter (94 pages)	"	
Ask Nature III: Chemistry of Everyday Life (110 pages)	"	
Teachers' Guides for Ask Nature I, II, and III	"	

Ask Nature IV: Motion and Energy will be published, December 1976.

PRESENT COMMERCIAL AFFILIATIONS:

Gyldendal, Klareboderne 3, 1115 Copenhagen K, Denmark
Lab Equipment from: PODIS, Buevej 7, Hillerød, Denmark

MATERIALS AVAILABLE FREE: Not answered

ADDITIONAL MATERIALS BEING DEVELOPED: Laboratory Equipment

TEACHER PREPARATION:

Consultant Services: Courses at The Royal Danish School of Educational Studies on how to live up to the new curriculum.

Pre-service and In-service Training: See above. Financed by the Danish State.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Availability of Evaluative Data: An English Survey. Write to Mr. Søsin Brandt Gyldendal, Klareboderne 3, 1115 Copenhagen K, Denmark.

PROJECT PUBLICITY:

Poul Thomsen: The Role of Books in Physics Teaching (Physics Education March 1975)

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE:

December 1976 Unit 5: Motion and Energy
Autumn 1977 Unit 6: Electromagnetism and Induction
Spring 1978 Unit 7: Atomic and Nuclear Physics
1979: Units for Grade 10

INITIATION AUX SCIENCES ET TECHNIQUES (IST)

Université Paris VII
Groupe de Travail de la Commission
de renovation de l'Enseignement
de la Physique Tour 23-5° Etage
2, pl. Jussieu - 75221 Paris Cedex 05
FRANCE

Director: G. Delacote

Project Duration: 1971-

Telephone: 336-25-25 / 325-12-21 Postes 4601 et 41-24

Age: 11-15
Ability: all
Subject: chem, phys, earth-space, eng/tech
Language: French
Translations: none
Testing of Students: written achievement tests, teacher judgments, student attitude q're

Materials Developed by Project:

Print	Non-Print
Textbooks	Slides
Activity Sheets	Films
Tchr. Manuals	Lab Equipment

Types of Learning Experiences:

- Lecture
- Lab Activities

PRINCIPAL PROFESSIONAL STAFF:

M. Delacote, Mlle Barboux, M. Charles, Mme Agabra, M. Dantan, M. Deforges, M. Verdy, M. Bourdon, M. Viovy, M. Chomat, M. Durey, M. Martinot-Lagarde, Mlle Galetti, M. Lemeignan, Mme Amiel, M. Magne, M. Vitali, Mlle Guesne, M. Soussan, M. Chabal, M. Martinand, M. de Preester, M. Simonetti, Mme Tiberghien

PROJECT HISTORY:

Principal Initiator(s): Ministry of Education (France)

Reason(s) for Project Initiation: Reform of scientific teaching in France.

Evolution and Development of the Project:

Work on different modules for 13-14 year old children, in laboratory. Experimentation with a small number of children by the professional staff. Generalization of the experiment with some 200 teachers in middle-schools. Extension of the reform to 11-12 year old children.

PROJECT OBJECTIVES:

Overall Project Purpose: Renovation of Physics and Technology teaching for 11 to 15 year old children in France.

Specific Objectives: To introduce a new style of teaching in Science and Technology which includes an analysis of the preconceptions of children and more freedom for students and teachers.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: The whole population of secondary schools in France, aged 11-15.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Modules for 13-14 year old: Astronomy, Automatisms, Chemistry, Electronics Photography, Polymers, Techniques of making	Not Given	IST

IST (2)

PRESENT COMMERCIAL AFFILIATIONS: Not answered

MATERIALS AVAILABLE FREE: Information Bulletin

ADDITIONAL MATERIALS BEING DEVELOPED:

In preparation:
- Energy for 13-14 year olds
- Meteorology for 11-12 year olds
- Motors "
- Light "
- Astronomy "
- Materials and forces "
- Chemistry "
- Technology of habitation "
- Statistics and measures "
- Electric circuit "

TEACHER PREPARATION:

Consultant Services:

2 sessions each year with professional staff of I.S.T. and experimenting teachers.
In-Service training in several universities with 20 coordinators.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

PROJECT PUBLICITY:

Agnes (Yves) - La rénovation de l'enseignement des Sciences Physiques in "Le Monde", 12 Mai 1972.

Viovy (R.) - Travaux de la Commission de réforme des programmes de Sciences Physiques et de Technologie - UNICHIMIE, 6, 1972.

LaGarrigue (A.) - La Commission ministérielle pour la rénovation de l'enseignement des Sciences Physiques: un premier bilan - Bull. Soc. Fran. Phys., 13, 14, 1973.

Delacote (G.) - Un groupe de travail, pourquoi faire? - Bull. Soc. Franc. Phys., 13, 20, 1973.

Delacote (G.) - Plaidoyer pour une recherche sur l'enseignement des Sciences Physiques - in "Actualité chimique", 1, 25, 1976.

A. Tiberghien, G. Delacote - Manipulations et représentations de circuits électriques simples par des enfants de 7 à 12 ans - Rev. Franc. Pédag., 34, 32, 1976.

PROJECT ACTIVITIES SINCE 1974 REPORT:

New modules for 13-14 year olds.
Interdisciplinary modules for 11-12 year olds.

PLANS FOR THE FUTURE: Not answered

ADVANCED PHYSICS PROJECT FOR INDEPENDENT LEARNING (APPIL)

Staff Inspector of Science
Inner London Education Authority (ILEA)
Room 278
The County Hall
London SE1 7PB
ENGLAND

Telephone: (01) 633-7682

Director: J. I. Bausor

Project Duration: 1974-1978

Age: 16-18
Ability: average, above average
Subject: physics
Language: English
Translations: none
Testing of Students:
- written achievement tests
- lab performance tests
- oral tests
- standardized tests
- teacher judgments
- student attitude q're

Materials Developed by Project:

Print	Non-Print
Lab Books	Slides
Supplementary Books	Overhead Trans.
Activity Sheets	Videotape
Tchr. Manuals	Slide Tape
Eval. Materials (tests)	Audiotape

Types of Learning Experiences:
- Lecture
- Seminar
- Discussion
- Independent Study
- Laboratory Activities
- Field Experiences
- Demonstrations
- Simulations
- Televised Lessons

PRINCIPAL PROFESSIONAL STAFF: Three ILEA teachers.

PROJECT HISTORY:

Principal Initiator(s): ILEA

Reason(s) for Project Initiation: To produce a more economical method of teaching very small A-level classes in physics.

Evolution and Development of the Project:

1. Report of Education Offices accepted by schools
2. Subcommittee of ILEA voted enough funds to pay teachers and auxiliary staff for two years initially. Project actually started in September 1975.

PROJECT OBJECTIVES:

Overall Project Purpose: To adapt existing physics courses into a largely self-instructional form, which may offer pedagogic advantages for students and which will make better use of teachers. In many ILEA secondary schools, the number of pupils enrolling for the various A-level courses is so small that they are no longer economically feasible. This adaptation should make it possible to teach A-level physics within a reasonable cost limit.

Specific Objectives: To produce an Advanced Level Physics course which will be 75% self-instructional, which can be carried out in the pupil's own school, and in which the students can work singly or in small groups, with only occasional reference to a teacher. For the other 25% of the time, pupils from a number of schools will be taught together, more or less conventionally, in a conveniently situated center.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Sixth form (aged 16-18) students of average or above average ability enrolled in advanced level physics courses.

Ways in which it differs from similar or previous programs: Self-instructional program.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Student Guides, based on existing textbooks	not purchasable	ILEA Media Resources Center
Videotapes, based on existing textbooks Slide-tape sequences, based on existing textbooks	not purchasable	ILEA Media Resources Center

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: Apply to Project Director

ADDITIONAL MATERIALS BEING DEVELOPED:

Preliminary work is in progress on similar projects for A-level chemistry and biology. If the results are promising, committee approval will be sought for a full scale extension to these fields.

TEACHER PREPARATION:

Pre-service and In-service Training: The normal in-service training facilities of the ILEA are being used.

PROJECT EVALUATED:

Yes _____ No X Internal _____ External Agency _____

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE: Not answered

COMPUTER BASED LEARNING PROJECT

The University of Leeds
Leeds 2
UNITED KINGDOM

Telephone: Leeds 31751 Ext. 7106

Director: J. R. Hartley

Project Duration: 1968-1977

Additional information, see also
Clearinghouse Reports: 9, 8

Age: 9-13
Ability: average, above average
Subject: chem, math, soc. sci., ed tech
Language: English
Translations: none
Testing of Students:
- written achievement tests
- teacher judgments
- student attitude q're

Materials Developed by Project:

Print	Non-Print
Supplementary Books	Computer Programs
Tchr. Manuals	
Eval. Materials	

Types of Learning Experiences:
- Demonstrations
- Simulations

PRINCIPAL PROFESSIONAL STAFF:

Director: J. R. Hartley
Associate Directors: Prof. K. Lovell and Dr. D. H. Sleeman
Staff: D. M. I. Macrae, A. J. Cole, K. Tait, T. Besant, F. R. Abbatt, F. Burnley, P. A. Sprules, S. Holden

PROJECT HISTORY:

Principal Initiator(s): J. R. Hartley

Reason(s) for Project Initiation: Research interests in learning, interest in teaching problems.

Evolution and Development of the Project:

1968/69-1972: Research Projects supported by research bodies.

1972-1975: Further period of research.

1973-1977: Major development Project supported by the government.

PROJECT OBJECTIVES:

Overall Project Purpose: Research in Computer Assisted Learning, Integration of computer as a teaching instrument within the day to day work of departments in the sciences or social sciences.

Specific Objectives:

1. Teaching Applied Statistics to Social Scientists (university level)
2. Teaching Chemistry to Undergraduates (particularly the planning of laboratory experiments)
3. Teaching Service Mathematics (calculus/matrix algebra) at University
4. Teaching Mathematics to School Children aged 9-13 years

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: School children (all abilities aged 9-13 years), University level undergraduates.

Ways in which it differs from similar or previous programs: (1) stresses adaptability and decision making (2) incorporates simulation and calculation modules within dialogue programs (3) develops more knowledgeable/"intelligent" teaching programs.

COMPUTER BASED LEARNING PROJECT (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Programs in Applied Statistics: a) Measures of Location and Dispersion b) Probability Theory c) Probability Distributions d) Sampling Theory e) Sampling Distributions f) Hypothesis Testing g) Correlation and Regression h) Non-parametric Statistics i) Analysis of Variance	Free	Computer Based Learning Project
Programs in Chemistry	Not given	Prof. P. Ayscough Dept. of Physical Chemistry, Leeds University

PRESENT COMMERCIAL AFFILIATIONS:

National Development Programme in Computer Assisted Learning
28 Mortimer Street
London, England

MATERIALS AVAILABLE FREE: See MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS

ADDITIONAL MATERIALS BEING DEVELOPED: Service Mathematics at University Level

TEACHER PREPARATION:

Consultant Services: Fully documented, appropriate manuals.

Pre-service and In-service Training: Workshops as appropriate, usually on specific (small) objectives, run as a series. Paid by Project - Funds from National Development Programme (British Government).

PROJECT EVALUATED:

Yes X No ___ Internal ___ External Agency X

Name of Outside Evaluators: See: National Development Programme in CAL
28 Mortimer Street
London, England

Pertinent Research Studies:

Hartley, J. R., 1973. The design and evaluation of an adaptive teaching system. Int. J. of Man-Machine Studies, Vol. 5, pp. 421-436.

In-House or Unpublished Research: (Annual) Reports on all projects are available.

Availability of Evaluative Data: Can have photo copies of questionnaires, etc.

PROJECT PUBLICITY:

Ayscough, P. B., 1973. Computer-based learning in the teaching laboratory. Chemistry in Britain. Vol. 9, No. 2, February 1973, pp. 61-65.

O'Shea, T., and Sleeman, D. H., 1973. A design for an adaptive self-improving teaching system. In J. Rose (Ed.) Advances in Cybernetics and Systems. Gordon & Breach, London.

COMPUTER BASED LEARNING PROJECT (3)

PROJECT PUBLICITY: (continued)

Self, J. A., 1973. An extended L^6 for a small machine. *Software World*, Vol. 4, No. 1, pp. 5-10.

Self, J. A., 1973. Natural language analysis using combinators. *Computer Studies in the Humanities and Verbal Behavior*. (In press)

Sleeman, D. H., and Phelps, W., 1973. A system for graphical communication in a CAI context. *Sig-Graph Newsletter*, Winter 1973 issue, pp. 5-22.

Sleeman, D. H., 1974. A problem solving monitor for a deductive reasoning task. *Int. J of Man-Machine Studies*, Vol. 7, pp. 183-211.

Self, J. A., 1974. Student models in computer-aided instruction. *Int. J. of Man-Machine Studies*, Vol. 6, No. 2, pp. 261-276.

Abbatt, F. R., and Hartley, J. R., 1974. Teaching planning skills by computer. *Int. J. of Mathematical Education in Science and Technology*, Vol. 5, pp. 665-671.

Hartley, J. R., 1974. Some experiences with individualized teaching systems. In R. Hooper and I. Toye (eds): *Computer Assisted Learning in the UK - Some Case Studies*, pp. 121-148. Council for Educational Technology.

Hartley, J. R., 1976. Computer assisted learning in the sciences: Some progress and some prospects. In D. Layton (ed): *Studies in Science Education*, Vol. 3, pp. 69-96

PROJECT ACTIVITIES SINCE 1974 REPORT: Continuing research and development.

PLANS FOR THE FUTURE: Continuing research and development.

CONCEPTS IN SECONDARY SCHOOL MATHEMATICS AND SCIENCE (CSMS)

Directors: Geoffrey Matthews
K.W. Keohane

Project Duration: 1974-1979

Centre for Science Education
Chelsea College, University of London
Bridges Place
Fulham, London, ENGLAND
SW6 4HR

Telephone: 01-736-3401

Age: 10-16
Ability: all
Subject: biol, chem, phys, math
Language: English
Translations: none
Testing of Students:
class tests,
individually scheduled student tests

Materials Developed by Project:

Print

Non-Print

Types of Learning Experiences:

PRINCIPAL PROFESSIONAL STAFF:

Geoffrey Matthews, Co-Director
Michael Shayer, Science
Hugh Wylam, Science
Kathy Hart, Mathematics
Margaret Brown, Mathematics
Dietmar Küchemann, Mathematics

PROJECT HISTORY:

Principal Initiator(s): Centre for Science Education. Funded by Social Science Research Council.

Reason(s) for Project Initiation: Need to identify suitable topics in secondary mathematics and science and match these to the developmental stages of the children.

Evolution and Development of the Project: The project is now halfway through its second year. Methods of calibrating children have been devised and used to find appropriate materials in mathematics and science.

PROJECT OBJECTIVES:

Overall Project Purpose:

The aim of this research is to extend work on concept formation in mathematics and science from the primary school to the secondary level. This should assist teachers and developers of the curriculum in making more firmly-based decisions: it is intended to establish preferred paths through the many possible variations of content and order, to identify appropriate learning materials and to evolve new methods of assessing children's progress.

A three-pronged attack will be made on these problems, by (i) identifying conceptual structures underlying school mathematics and science. (ii) pinpointing learning difficulties and devising methods of overcoming them, and (iii) developing evaluatory instruments for monitoring children's progress.

The methods used will be those of 'middle-level' research (somewhere between fundamental controlled experiments and short-term ad hoc work). Individual testing of children will be carried out, both written and verbal, to identify stages of development and appropriate topic levels. A second line of approach involves the use of whole classes of children, 'calibrated' so that they themselves can provide indications of types of response at different levels. New assessment techniques will be explored concurrently with the search for a hierarchy of concepts.

CSMS (2)

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: A sample of the entire population.

Ways in which it differs from similar or previous programs: There have been no similar programs.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: Trial Tests Only.

PRESENT COMMERCIAL AFFILIATION: Not Applicable

MATERIALS AVAILABLE FREE: Not Applicable

ADDITIONAL MATERIALS BEING DEVELOPED:

Instruments for identifying stages of development and corresponding topics.

TEACHER PREPARATION:

Pre-service and In-service Teaching Materials: In the end, we hope to provide teachers with instruments so that they themselves can evaluate materials and match them to their children.

PROJECT EVALUATED: The program itself is an evaluating one.

PROJECT PUBLICITY: Not Answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not Answered

PLANS FOR THE FUTURE: Not Answered

CONTINUING MATHEMATICS PROJECT (CMP)

Mantell Building
University of Sussex
Brighton, Sussex
ENGLAND

Telephone: Brighton (0273) 66755 (X953)

Director: R. W. Morris

Project Duration: 1971-1976

Additional information, see also Clearinghouse Reports: 9

Age: 16, 17, 18, adult
Ability: all
Subject: math
Language: English
Translations: none
Testing of Students: written achievement tests, lab. performance tests

Materials Developed by Project:

Print	Non-Print
Programmed Units	Slides
Tchr. Manuals	Filmstrips
Eval. Materials	Games
Behavioral Objectives	
Newsletters	

Types of Learning Experiences

- Independent Study
- Lab Activities
- Simulations
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF: R. W. Morris, Director; Team Members: M. J. Gould, G. Haw, R. J. Hayter, K. Oliver, C. J. Rutter, and K. L. Winter.

PROJECT HISTORY:

Principal Initiator(s): National Council for Educational Technology (NCET)

Reason(s) for Project Initiation: Students entering tertiary education, in a wide range of disciplines require some familiarity with its mathematics and its uses. There are, however, insufficient mathematics teachers to satisfy the demand from both 'A' level mathematics specialists and from non-specialists who require mathematics as background to their own subjects. The Continuing Mathematics Program was initiated to alleviate this problem by providing materials which a 6th Form student can use independently of a specialist mathematics teacher.

Evolution and Development of the Project: 1968 - Dainton Committee Report recommended that mathematics should be an ingredient of the curriculum of all students until they leave school. National Council for Educational Technology carried out a study to determine feasibility of producing self-learning mathematics materials for post-O Level students. Project supported by 12 industrial firms and four public bodies. Materials production began in 1971, based at Sussex University. Dissemination phase began in 1976.

PROJECT OBJECTIVES:

Overall Project Purpose: To produce "self-learning" mathematics materials for the post O-Level or CSE student who is entering a field other than mathematics, but who requires some additional mathematics skill for advanced work in his chosen field (biology, economics, geography, sociology, psychology etc.)

Specific Objectives: Specific objectives are stated in each unit.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students of subjects other than mathematics (16-19 years of age).

Ways in which it differs from similar or previous programs: The mathematics is designed for use in the context of these subjects: Physics, Chemistry, Biology, Geography, Economics, Business Studies etc.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Category 1 (single, independent revisions units)	£0.60	CMP
Positive and Negative Numbers	per	
$y = mx + c$	copy	
Inequalities		
Working with Ratios		
Transformation of Formulae		
Trigonometry of the Right Angled Triangle		
Trigonometry of the General Triangle		
An Introduction to Sets		
${}_nC_r$- Calculation and Use		
Indices and Standard Form		
Computation with Logarithms		
Theory of Logarithms		
Using Logarithms to Determine Relationships		

Category 2 (introductory units)
- Flowcharts and Algorithms
- Critical Path Analysis
- Further Critical Path Analysis
- Systems
- Information and Coding I
- Linear Programming
- Mathematics of Finance

Category 3 (short courses of work)
- Information and Coding - 4 units
- Elementary Calculus - 5 units
- Growth in Biological Populations-1 unit
- Statistics
    - Descriptive Statistics - 3 units
    - Elementary Probability - 3 units
    - Hypothesis Testing - non-parametric methods - 3 units
    - The Binomial and Normal Distributions - 6 units
      last 2 of sequence
    - The X^2 test
    - Correlation
    - Mathematics in Geography

PRESENT COMMERCIAL AFFILIATIONS:

The materials will eventually be published by the Longman Group, Burnt Mill, Harlow Essex, England.

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: None

TEACHER PREPARATION:

Consultant Services: Supplied by Project. (Trials Organizer).

Pre-service and In-service Training: Annual Conference for tutors in Trial Organizations plus assistance on request to Local Education Authorities who arrange and finance local courses for teachers.

TEACHER PREPARATION: (continued)

Pre-service and In-service Teaching Materials: Each unit has its own associated "Teacher's Guide".

PROJECT EVALUATED:

Yes X No ____ Internal ____ External Agency ____

In-House or Unpublished Research: Following revision after developmental testing, units have been tested in schools, colleges, and universities in Britain. Over 50 institutions have taken part since 1972. Students and tutors have provided feedback information by means of comment sheets, questionnaires and discussions with team members. It is anticipated that about 100 institutions will be involved in the final year of field trials.

PROJECT PUBLICITY:

R. W. Morris. For Independent Learning Times Educational Supplement April 18, 1975.
Continuing Mathematics Project News (Newsletter).

PROJECT ACTIVITIES SINCE 1974 REPORT:

Continuing production and trials of units.

PLANS FOR THE FUTURE:

Dissemination project proposed to run from September 1976 to August 1978.

ENVIRONMENTAL EDUCATION STUDY

Arts B (Education Area)
University of Sussex
Falmer, Brighton, Sussex
ENGLAND

Telephone: Brighton 66755

Director: R. W. West

Project Duration: 1975-1977

Age: 5-18,
teacher education
Ability: all
Subject: environ. ed.
Language: English
Translations: none
Testing of Students:
not applicable

Materials Developed by Project:

Print	Non-Print
Handbook Series of Research Papers	

Types of Learning Experiences:

Project evaluates a wide variety of learning experiences

PRINCIPAL PROFESSIONAL STAFF:

Mr. A. Horton, Research Fellow
Mr. I. Goodson, Research Fellow
Mr. D. J. Burrell, Faculty assisting Study Team
Mr. E. A. Catnerall, " " "
Dr. M. R. Eraut, " " "
Mrs. W. Graham, " " "
Mr. D. F. Hogan, " " "

PROJECT HISTORY:

Principal Initiator(s): University of Sussex and Council for Environmental Education

Reason(s) for Project Initiation: General lack of clarity regarding aims, objectives, and teaching - learning strategies at primary and secondary school level in field of environmental education.

PROJECT OBJECTIVES:

Overall Project Purpose:

To undertake a detailed analysis of the wide range of inter - and multi-disciplinary approaches to environmental education currently being developed in the schools under such headings as Environmental Studies, Environmental Science, Rural Studies, Urban Studies.

To seek to define the varying perceptions of environmental problems held by social and natural scientists, technologists, geographers, industrialists and politicians.

To define the roles various disciplines and modes of inquiry might play in the development of an integrated educational programme at primary and secondary levels.

To review available resources in the light of the above analysis of practice and expectation.

Specific Objectives: The Study Team will hope to develop:

1. A summary of alternative sets of aims, objectives and possible conceptual structures for various approaches to the study of the environment.
2. Case study reports of a range of successful and failed innovations in the field of environmental education.
3. Sample course designs which incorporate different curricular strategies associated with particular aims and the key decision making areas within the school.
4. Sample teaching and learning materials aimed at exemplifying varying concepts, skills and strategies.

ENVIRONMENTAL EDUCATION STUDY (2)

PROJECT OBJECTIVES:

Specific Objectives: (continued)

5. Teaching materials for use in pre - and in-service training and support contexts.
6. A survey of the resources available for use in teaching and an indication of how these might be used to support possible courses.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Full age (5-18+) and ability range and across the full curriculum (Arts & Science).

Ways in which it differs from similar or previous programs: The project is a research study of existing practice leading to definitions of future practice. It is not a materials development project. The main research technique being used is that of illuminative case studies of teaching programs in schools and colleges of further education.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
1. "Interim Report" July, 1975	Free	Project
2. "The Classification of Approaches to Environmental Education: A Handbook for Analysis"	50p	

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: Small cover charge for postage etc. for both above items.

ADDITIONAL MATERIALS BEING DEVELOPED:

1. A series of illuminative case studies (Fall 1976)
2. Readings in Environmental Education (Spring 1977)
3. Final Report (Summer 1977)

TEACHER PREPARATION:

Consultant Services: Teachers are fully involved in the development of the case studies.

Pre-service and In-service Training: A short series of teacher workshops is being considered for Spring/Summer 1977.

Pre-service and In-service Teaching Materials: Not applicable

PROJECT EVALUATION: Whole study is evaluative in orientation.

Availability of Evaluative Data: None as yet.

PROJECT PUBLICITY:

West, R. W. 'Environmental Education: some problems of definition & approach' Bulletin of Environmental Education, 46, Feb 1975 p 9-11.

West, R. W. 'The Environmental Education Study - Interim Report, 1975' Review of Environmental Education Developments, Aug 1975.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE:

The project will report in full by summer 1977. Main publications will be in the form of case studies.

HIGHER EDUCATION LEARNING PROJECT (PHYSICS)
[H.E.L.P. (P.)]

Chelsea College Centre
for Science Education
Bridges Place
London SW6 4HR
ENGLAND

Telephone: 01-736 3401

Director: Jon Ogborn

Project Duration: 1972-1977

Age: adult
Ability: university students
Subject: physics
Language: English
Translations: none
Testing of Students: none

Materials Developed by Project:

Print	Non-Print
Tchr. Manuals	none
Newsletters	

Types of Learning Experiences:
Seminar
Discussion
Independent Study
Lab Activities

PRINCIPAL PROFESSIONAL STAFF:

Lewis Elton, Paul Black, Peter Unsworth, Barbara Hodgson, D. Brandt, Will Brofe, R. Lawrence.

PROJECT HISTORY:

Principal Initiator(s): Jon Ogborn, Paul Black

Reason(s) for Project Initiation: The existence of a group of university physics teachers dissatisfied with the teaching of physics in the university.

Evolution and Development of the Project: The project has evolved as a group enterprise, developing ideas for teaching, evidence about teaching situations, and a critique of old and new methods.

PROJECT OBJECTIVES:

Overall Project Purpose: to improve the teaching of physics at the college level.

Specific Objectives:

Work is focused on:

1. individual study (non-lecture)
2. group teaching
3. laboratory work
4. motivation

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Target readership is university science teachers.

Ways in which is differs from similar or previous programs: The project is entirely focused on the teacher. No student materials are produced.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Materials	Cost	Source
In production, four book titles:		
Individual Study in University Science Teaching	about $10.00	Heineman Educ. Books
Problems of Small Group Teaching in University Science	"	"
The Experimental Art of Teaching The Art of Experiment	"	"
A Study of Student Motivation	"	"
Newsletter	Free	"

HIGHER EDUCATION LEARNING PROJECT (PHYSICS) (2)

PRESENT COMMERCIAL AFFILIATIONS:

Heineman Educational Books
48 Charles Street
London W1X 8AH

MATERIALS AVAILABLE FREE: See Materials Already Produced, Including Sources and Costs.

ADDITIONAL MATERIALS BEING DEVELOPED: None

TEACHER PREPARATION:

Pre-service and In-service Training: The entire project is directed to inservice teacher training at the university level.

Pre-service and In-service Teaching Materials: See Materials Already Produced, Including Sources and Costs.

PROJECT EVALUATED:

Yes _____ No X Internal _____ External Agency _____

Availability of Evaluative Data: Data is available through personal contact with coordinator.

PROJECT PUBLICITY:

Black, P.J., Ogborn, Jon. "The Higher Education Learning Project (Physics)" in Physics Education, Vol. 8, pp. 400-401.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Development and trial of ideas by groups of university teachers in up to a dozen British University physics departments.

PLANS FOR THE FUTURE:

Publications now in preparation (expected 1977)
Conferences and meetings

INNER LONDON EDUCATION AUTHORITY (ILEA) 11-13 SCIENCE

Staff Inspector of Science, ILEA
Room 278
The County Hall
LONDON SE1 7PB
ENGLAND

Telephone (01) 633-7682

Director: D. P. Marshall

Project Duration: 1974-1978

Age: 11-13
Ability: all
Subject: biol, chem phys
Language: English
Translations: none
Testing of Students: written achievement tests oral tests, standardized tests, teacher judgments

Materials Developed by Project:

Print	Non-Print
Activity Sheets	Slides
Tchr. Manuals	Overhead Trans.
	Video Tape
	Slide Tape
	Audiotape
	Games
	Models

Types of Learning Experiences:

Lecture
Discussion
Independent Study
Lab Activities
Demonstrations
Simulations
Televised Lessons
Audio/Visual

PRINCIPAL PROFESSIONAL STAFF: Three ILEA teachers

PROJECT HISTORY:

Principal Initiator(s): Inner London Education Authority

Reason(s) for Project Initiation: To improve the teaching of science in ILEA Schools, in particular the science taught in the first 2-3 years of the secondary school (ages 11-13).

Evolution and Development of the Project: Report of Education Officer accepted by Schools Sub-Committee of ILEA, who voted enough funds to pay teachers and auxiliary staff for 2 years initially. Project actually started in Sept 1975.

PROJECT OBJECTIVES:

Overall Project Purpose: To improve the teaching of science to pupils in the 11-13 age range of ILEA Secondary Schools, particularly in view of the nature of the student population and the fact that many ILEA science teachers have not been trained as teachers.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Whole range of ability of students ages 11-13 which in inner London is weighted towards the lower end.

Ways in which it differs from similar or previous programs: No intention to generate a new course, but rather to make better use of existing courses, such as Nuffield Combined Science, Scottish Science for the 70s and Schools Council Science 5/13.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Worksheets	See note below	ILEA Media Resources Center
Teacher and Technician Guides		
Tape Slide Sequences		
Games		

Write to project director to obtain materials available for inspection. No materials are purchasable at present, but may be available within a year.

PRESENT COMMERCIAL AFFILIATIONS:

ILEA Media Resources Center
County Hall
London SE 1 7PB England

MATERIALS AVAILABLE FREE: Write to project director

ADDITIONAL MATERIALS BEING DEVELOPED:

Materials to be developed include additional worksheets, audio-visuals, games teacher and technician guides.

TEACHER PREPARATION:

Pre-service and In-service Training: The normal in-service training facilities of the ILEA are being used to train teachers in this project.

PROJECT EVALUATED:

Yes _____ No _X_ Internal _____ External Agency _____

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE:

Plans for continued development are uncertain at present. These will be determined during the next 12-18 months.

MATHEMATICS 5-11

Education Offices
St. John's Square
Wolverhampton WV2 4DB
ENGLAND

Telephone: Wolverhampton 27811 Ext. 271

Directors: Eric A. Albany
Geoffrey Matthews

Project Duration: 1976-1977

Additional information: see also the 20-Year Cumulative Directory for title change.

Age: 4-11
Ability: all
Subject: mathematics
Language: English
Translations: none
Testing of Students: teacher judgments

Materials Developed by Project:

Print	Non-Print
Textbooks	none
Supplementary Books	
Activity Sheets	
Teacher Manuals	

Types of Learning Experiences:

Lecture

PRINCIPAL PROFESSIONAL STAFF:

Writing team consisting of Primary Teachers, Principals, College Lecturers, Wardens of Teachers' Centers, Maths Advisers.

PROJECT HISTORY:

Principal Initiator(s): Professor Geoffrey Matthews

Reason(s) for Project Initiation: Need for revision of materials produced in Teachers' Guides for the Nuffield Maths Teaching Project and for the production of pupil material.

Evolution and Development of the Project: Writing is being undertaken at the moment.

PROJECT OBJECTIVES:

Overall Project Purpose: To revise and extend the work done by the Nuffield Foundation Mathematics Teaching Project.

Specific Objectives:

1. To provide expendable and non-expendable materials for pupils in the age range just under 5 to just over 11 years, together with Teacher's Handbooks giving guidance on the use of the materials and suggestions for extension.
2. To link with the Early Mathematical Experiences Project (E.M.E.) in stressing the importance of language and activity in the teaching of mathematics.
3. To select the best of so-called "modern" and "traditional" approaches to mathematics teaching.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students ages 4-11 of all ability levels.

Ways in which it differs from similar or previous programs: The Project is able to benefit from the experience and advice of teachers who have been involved in the original Nuffield Mathematics Project.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: Materials in first draft form only. Preparations are being made for trials.

PRESENT COMMERCIAL AFFILIATIONS:

Longman Group Ltd.,
Longman House
Burnt Mill
Harlow, Essex CM20 2JE, England

MATHEMATICS 5-11 (2)

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered.

TEACHER PREPARATION: Not answered

PROJECT EVALUATED:

Yes ____ No _X_ Internal ____ External Agency ____

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE:

Trials of Infant (5-7) Material	September 1976
Publication	July 1977
Trials of Junior (7-11) Material	February 1977
Publication	December 1977

MATHEMATICS CURRICULUM: A CRITICAL REVIEW. SCHOOLS COUNCIL PROJECT

Education Building
University Park
Nottingham, NG7 2RD
ENGLAND

Telephone: Nottingham 56101, EXT. 2298
(STD code 0602)

Director: J. V. Armitage

Project Duration: 1973-1976

Additional information, see also Clearinghouse Reports: 9

Age: 11-16, T.Ed.
Ability: all
Subject: math
Language: English
Translations: none
Testing of Students: not applicable

Materials Developed by Project:

Print	Non-Print
Overview Newsletters Series of books not yet published	None

Types of Learning Experiences:

Not Applicable

PRINCIPAL PROFESSIONAL STAFF:

Dr. J. V. Armitage, College of St. Hild and St. Bede, Durham, England, Director.
Mr. Geoffrey R. H. Boys, Editor
Mrs. Julie A. Gadsden, Assistant Editor

PROJECT HISTORY:

Principal Initiator(s): Schools Council

Reason(s) for Project Initiation: To enable teachers to perform their own critical appraisal of current courses and materials in view of the wide range of new mathematics courses produced in the last 15 years.

Evolution and Development of the Project: Since May 1973 all nine booklets in the series have been planned and the planning material has been sent to groups of teachers for comment and criticism. Now all the booklets are being written and the first three manuscripts will be ready for the publishers by the summer of 1976.

PROJECT OBJECTIVES:

Overall Project Purpose: Mathematics teachers today face a daunting array of modern literature and novel classroom material. The aim of the project is to help teachers perform their own critical appraisal of existing mathematics syllabuses and teaching apparatus for the secondary school pupil (age range 11-16).

Specific Objectives: The following booklets are being written: Number, Geometry, Algebra, Combinatorics, Applications, Calculus, Inter-Disciplinary Activities, 11-13 Curriculum. These booklets will: 1) give a synoptic view of the topic at school level; 2) show how the topic connects up with other branches of mathematics; 3) discuss ways of introducing the topic to differing backgrounds and abilities of pupils; 4) analyze the advantages and disadvantages of each approach with regard to mathematical development and classroom presentation; 5) investigate possible applications; and, 6) review a small number of current texts in the light of the differing approaches and objectives. In addition, a unifying booklet entitled "The Aims and Objectives of Teaching Mathematics" will attempt to set in a wide perspective the topics which occupy the foreground in the preceding studies and will serve as an introduction to the series.

Each survey involves three stages of development. In the first stage, planning material is written which outlines the contents of the eventual booklet and includes some draft articles. This planning material is duplicated in limited quantities for circulation among groups of teachers. During the second stage these groups review the planning material and contribute further articles. In the third stage an Editorial Fellow writes the booklet.

MATHEMATICS CURRICULUM: A CRITICAL REVIEW. SCHOOLS COUNCIL PROJECT (2)

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: This series of booklets is being written for mathematics teachers in secondary schools; in particular, for the heads of departments. It is also hoped that they will be used for in-service training and that they will have some influence on those people who will be preparing the syllabuses and courses of the future.

Ways in which it differs from similar or previous programs: This project is the only one in Britain which sets out to provide a 'critical review' of existing courses.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

No materials published so far. Publication to start in 1977.

PRESENT COMMERCIAL AFFILIATIONS: Publisher to be decided in the next month or so.

MATERIALS AVAILABLE FREE: Newsletter

ADDITIONAL MATERIALS BEING DEVELOPED: None

TEACHER PREPARATION:

Consultant Services: Not applicable

Pre-service and In-service Training: It is hoped that the series of booklets will be used in in-service teacher training courses, among other uses.

Pre-service and In-service Teaching Materials: Not applicable

PROJECT EVALUATED:

The purpose of the project itself is to evaluate existing courses.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT:

The whole series of nine booklets is now in various stages of writing. The first three manuscripts - Geometry, Algebra and Number - will be handed to the publishers by the summer of 1976 and should be available during 1977.

PLANS FOR THE FUTURE:

The other six booklets - Combinatorics, 11-13 Curriculum, Applications, Interdisciplinary Activities, Calculus and The Aims and Objectives of Teaching Mathematics - should be available during late 1977 and early 1978. The project is due to finish its work in August this year.

NATIONAL DEVELOPMENT PROGRAMME IN COMPUTER ASSISTED LEARNING (NDPCAL)

37/41 Mortimer Street
London W1N 7RJ
ENGLAND

Telephone: 01-580 2226/
01-637-0552

Director: R. Hooper

Project Duration: 1973-1977

Age: 9-12, 18+
Ability: all
Subject: biol, chem, phys, math, soc. sci, eng/tech, nuclear eng, medicine, geography, history, reading
Language: English
Translations: none
Testing of Students: lab performance tests, teacher judgments, student attitude q're and external evaluators

Materials Developed by Project:

Print	Non-Print
Lab Books	Slides
Programmed Units	Overhead Trans.
Activity Sheets	Slide Tape
Tchr. Manuals	
Eval. Materials	
Overview	
Newsletters	

Types of Learning Experiences:

Lecture
Seminar
Independent Study
Lab Activities
Demonstrations
Simulations
(all individualized)

PRINCIPAL PROFESSIONAL STAFF:

R. Hooper, Director
R. J. Miles, Assistant Director

PROJECT HISTORY:

Principal Initiator(s): Seven United Kingdom Government Departments

PROJECT OBJECTIVES:

Overall Project Purpose: The aims of the National Programme are:

1. to develop and secure the assimilation of computer assisted and computer managed learning in a regular institutional basis at reasonable cost; and
2. to make recommendations to appropriate agencies in the public and private sectors concerning possible future levels and types of investment in computer assisted and computer managed learning in education and training.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: 1) in tertiary education, 2) in primary and secondary education, 3) for training in the Armed Services, and 4) for management and technician training in industry.

Ways in which it differs from similar or previous programs: 1) Unique as a National Programme, 2) Stepped funding, and 3) Development not research.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
CALNEWS (quarterly newsletter)	Free	NDPCAL
NDPCAL Information Leaflet	Free	NDPCAL
Project Summaries from Individual Projects in Science and Mathematics including: An Institutionalisation Project in CAL Applied Statistics for Social Science Students Computer Assisted Learning in Engineering Science Computational Physics Teaching Laboratory Computer Assisted Learning in Chemistry Further and Higher Education Service Mathematics Computers in the Undergraduate Science Curriculum (CUSC) Basic Mathematics at Undergraduate Level Hertfordshire Computer Managed Mathematics Computer Assisted Technological Education of Service Personnel Computer Assisted Learning in Nuclear Science and Technology	Free	NDPCAL

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (Continued)

Material	Cost	Source
Project Summaries from Individual Projects in Science and Mathematics including: (continued) Computer Scheduling of REME Training Physical Sciences Program Exchange Havering/Lothian Transferability Project	Free	NDPCAL
Program Index	Free	NDPCAL
Publications and Presentations	Free	NDPCAL
Technical Reports (available from NDPCAL at 35p per copy plus postage and handling. List of Reports can be obtained from NDPCAL)	35p/copy plus postage	NDPCAL
Two Years On, The National Development Programme in Computer Assisted Learning, Report of the Director. CET: London.	£1.25 plus postage	NDPCAL
Computer Assisted Learning in the UK - Some Case Studies. Edited by Hooper, R. and Toye, I. CET: London	£3.75 plus postage	NDPCAL

PRESENT COMMERCIAL AFFILIATIONS:

Councils and Education Press Limited
10 Queen Anne Street
London W1M 9LD
ENGLAND

MATERIALS AVAILABLE FREE: See Materials Already Produced, Including Sources and Costs.

ADDITIONAL MATERIALS BEING DEVELOPED:

The National Programme consists of approximately thirty projects, of which about 15 are in mathematics and science. Consult individual projects for plans for additional materials development.

TEACHER PREPARATION:

Consultant Services: Individual projects provide documentation.

Pre-service and In-service Training: Workshops, conferences and exhibitions; government funded.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency X

Name of Outside Evaluators: UNCAL (Understanding Computer Assisted Learning), Peat, Marwick, Mitchell & Company.

Pertinent Research Studies: The Programme at Two - An UNCAL Companion to Two Years On. Available from UNCAL, CARE, Norwich, England.

Availability of Evaluative Data: Financial Evaluators: Mr. J. Fielden, Peat, Marwick Mitchel & Co., Management Consultants, Austral House, Basinghall Avenue, London E.C.2, England. Educational Evaluators: Mr. B. MacDonald, Centre for Applied Research in Education, University of East Anglia, Norwich, Norfolk NR4 7TJ, England.

PROJECT PUBLICITY:

"Publications and Presentations" - A list of published and unpublished papers by people working within the program, available from NDPCAL.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Current activities of the project are outlined in a document entitled, "Project Summaries" which is available from NDPCAL.

NDPCAL (3)

PLANS FOR THE FUTURE:

Exhibitions - Between October and December 1977, there will be a series of exhibitions of educational and software materials produced by National Programme projects, in Cardiff, Coleraine, Exeter, Glasgow, Leeds and London.

Publications - All final reports on projects and recommendations for the future will be published by 31st December 1977, the closing date of the National Programme.

Conference - CAL 77 Symposium on CAL in the Biological Medical and Physical Sciences and Engineering.
30 March - 1st April 1977, University of Surrey, Guildford, Surrey.

NUFFIELD COMBINED SCIENCE CONTINUATION PROJECT

Ringinglow
43 Lyttelton Road
Droitwich Worcs
WR9 7AB
UNITED KINGDOM

Telephone: Droitwich 3273

Director: C. D. Bingham

Project Duration: 1966 -

Additional information: see also the 20-Year Cumulative Directory for title change.

Age: 9-13
Ability: all
Subject: biol, chem, phys, earth-space, combined sci.
Language: English
Translations: none
Testing of Students: teacher judgments

Materials Developed by Project:

Print	Non-Print
Activity Sheets	Slides
Tchr. Manuals	Filmloops
	Slide Tape
	Lab Equipment

Types of Learning Experiences:

- Independent Study
- Lab Activities
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

C. D. Bingham, Director
M. J. Elwell, Consultant Organizer
And teams of practicing teachers as writers

PROJECT HISTORY:

Principal Initiator(s): C. D. Bingham, M. J. Elwell

Reason(s) for Project Initiation: Need for comprehensive introductory course in science.

Evolution and Development of the the Project: Production of Nuffield Combined Science Teacher's Guides I, II and III - 1970.
Activity packs 1-10 published in 1970.
Study cards and activity cards are to be published in 1976.

PROJECT OBJECTIVES:

Overall Project Purpose: To extend the age range and suitability of materials of combined science for all abilities within the ages 9-13.

Specific Objectives: Production of: 1) Study Cards which give background information, stimulate inquiry and pose specific questions; and 2) Activity Cards which outline procedure for carrying out investigations.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Comprehensive range of pupils within the age range 9-13.

Ways in which it differs from similar or previous programs: New materials are produced as themes, each theme having 4 study cards giving information, stimulation and posing questions. Study cards are supported by activity cards.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Combined Science Teacher's Guide I, II and III	not given	Longmans
Combined Science Activities Pack 1-10	not given	Longmans
Filmloops	not given	Longmans
Brochure	Free	Longmans

NUFFIELD COMBINED SCIENCE CONTINUATION PROJECT (2)

PRESENT COMMERCIAL AFFILIATIONS:

Longmans Group Ltd.
Fourth Avenue
Harlow Essex
CM 195AA

MATERIALS AVAILABLE FREE: Brochure

ADDITIONAL MATERIALS BEING DEVELOPED:

Study cards, activity cards, tape/slide and programmed learning program on energy.

TEACHER PREPARATION:

Consultant Services: Project Organizers,
Center for Science Education, Chelsea College,
Some colleges of education and University Departments of Education

Pre-service and In-service Training: Lectures and courses run by project organizers.

Pre-service and In-service Teaching Materials: none

PROJECT EVALUATED:

Yes ____ No X Internal ____ External Agency ____

Name of Outside Evaluators: none

Pertinent Research Studies: none

In-House or Unpublished Research: Trials of new materials conducted in middle schools for ages 8-12 and 9-13.

Availability of Evaluative Data: none available

PROJECT PUBLICITY:

Education in Science No. 51, January 1973

PROJECT ACTIVITIES SINCE 1974 REPORT:

Survey of use of Combined Science in middle schools and development of new materials.

PLANS FOR THE FUTURE:

Continued production of materials extending the Nuffield Combined Science Project to the variety of school situations for students aged 9-13.

NUFFIELD O-LEVEL PHYSICS TEACHING PROJECT - REVISION

Nuffield Foundation
Nuffield Lodge
Regents Park
London, NW1 4RS
ENGLAND

Telephone: 01 722 8871

Directors: E. M. Rogers
E. J. Wenham

Project Duration: 1971-1976

Additional information: see also Clearinghouse Reports 9,6,5,4 and the 20-Year Cumulative Directory for title change.

Age: 11-16
Ability: average, above average
Subject: physics
Language: English
Translations: Japanese,Spanish
Testing of Students: written achievement tests
tchr. judgments

Materials Developed by Project:

Print	Non-Print
Textbooks	Lab Equipment
Lab Books	
Tchr. Manuals	
Overview of Project	

Types of Learning Experiences:
Discussion
Lab Activities
Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Professor Eric M. Rogers, Organizer
Mr. E. J. Wenham, Associate Organizer

Experienced classroom teachers as consultants.

PROJECT HISTORY:

Principal Initiator(s): Nuffield Foundation

Reason(s) for Project Initiation: Requested by teachers through Association for Science Education.

Evolution and Development of the Project: For both the Nuffield O-Level Physics Teaching Project and the present revision.

Consultation with groups of teachers
Editing and publishing of Teachers' Guides,
Guides to Experiments (for setting up apparatus)
Questions Books (major learning aids)

PROJECT OBJECTIVES:

Overall Project Purpose:

To offer schools (in Britain and elsewhere) a suggested 5-year physics teaching program which emphasizes teaching for understanding rather than for rote memory.
To provide Guides for teachers, discussing such aims, and methods of teaching toward them.
To develop kits of apparatus (and some demonstration equipment) to facilitate such teaching.
To place more emphasis on modern (atomic) physics.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target population: Originally for "Grammar School" (academic high schools). Now, in revision for wider range of abilities for ages 11-16.

Ways in which it differs from similar or previous programs: Emphasis on learning for understanding. Much less emphasis on memorizing or a "plugging" into formulas.

NUFFIELD O-LEVEL PHYSICS TEACHING PROJECT - REVISION (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
1966 Teachers' Guides Years I, II, III, IV, V	Not Given	Books from Longman Group, Ltd.
Guide to Experiments Years I, II, III, IV, V	Not Given	Apparatus from suppliers in England
Questions Books Years I, II, III, IV , V	Not Given	"
New Teachers' Guide Second Edition Years 1, 2, 3, 4, 5	Not Given	"
Pamphlet and Price List	Free	Science Teaching Project, Chelsea College of Science & Technology, Bridges Place London, SW6 4HR England

PRESENT COMMERCIAL AFFILIATIONS:

Longman Group Ltd.,
Longman House,
Burnt Mill,
Harlow, Essex.

Date of latest edition: 1976

MATERIALS AVAILABLE FREE: See Materials Already Produced, Including Sources and Costs.

ADDITIONAL MATERIALS BEING DEVELOPED:

The five volumes of Pupils' Text are new and will be published in 1976.

TEACHER PREPARATION:

Consultant Services: Colleges of Higher Education and Science Teaching Centres offer courses. See announcements in "Physics Education" and "School Science Review", both of which are published in England.

PROJECT EVALUATED:

Yes X No ____ Internal ____ External Agency X

Name of Outside Evaluators: Oxford & Cambridge Joint Schools' Examination Board set specific Nuffield physics paper for students at the end of five years.

In-House or Unpublished Research: The Examiners have reported a clear proportion of successful answers in these examinations, compared with their traditional examinations in physics, which are still offered to other schools.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Complete revision of both Teachers Guides and Guides to Experiments, combined with Pupils' Texts written for this new edition, incorporating the earlier Questions Books. Those include questions that ask for reasoning, imagination and use of the physics studied. Pupils' Tests also have 'progress questions' which are simpler, more factual, intended for less academic students.

PLANS FOR THE FUTURE: We expect the new Pupils' Text for Year 3 and the revised Teachers' Guide for Year 3 to become available from Longmans, Burnt Mill, Harlow, Essex (January 1977). Similar books for Years 1, 2, 4 and 5 are in full preparation.

NUFFIELD WORKING WITH SCIENCE

Department of Education
University of Keele
Keele
Staffs, UNITED KINGDOM

Telephone: Keele Park 731

Director: K. Wild

Project Duration: 1972-1978

Age: 16-19
Ability: average,
above average
Subject: science, soc. sci.
interface
Language: English
Translations: none
Testing of Students:
teacher judgments

Materials Developed by Project:

Print
Lab Books
Programmed Units
Activity Sheets
Tchr. Manuals
Overview

Non-Print
Slides
Filmstrips
Audiotape

Types of Learning Experiences:
Discussion
Independent Study
Laboratory Activities
Field Experiences

PRINCIPAL PROFESSIONAL STAFF:

J. K. Gilbert, Evaluator
H. Misselbrook, C. Elliott, J. Taylor, N. Stears, D. Tomley - Area Coordinators

PROJECT HISTORY:

Principal Initiator(s): K. Keohane

Reason(s) for Project Initiation:

1. Follow-up to Nuffield Secondary Science
2. Lack of material for non-A-level students in science

Evolution and Development of the Project:

Phase I	1972-73:	Writing of four trial units and conduction of feasibility study.
Phase II	1973-74:	Establishment of workshop groups for writing and production of 15 units.
Phase III	1974-75:	Trial of 15 units. Appointment of director. 25 more units produced.
Phase IV	1975-76:	Trial of 25 units. Rewriting of earlier units pre-publication.

PROJECT OBJECTIVES:

Overall Project Purpose: To produce independent learning packages giving a wide view of science and involving the application of the method, skills and attitudes of the scientist to a wide range of topics.

Specific Objectives: There are objectives specific to each unit, as well as some which overlap several units.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Post-CSE Non A-level students, ages 16-18.

Ways in which it differs from similar or previous programs:

a. student choice of topics.
b. choice of sub-units within each topic.
c. self-programming material.
d. broad time-of-use recommendations only.
e. involvement with outside community.
f. not directed toward an external examination.
g. intra-school assessment based on presentation to peer group.
h. use of non-book material.

NUFFIELD WORKING WITH SCIENCE (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Trial Units on 40 topics including: Brewing Noise Prejudices and Superstitions Automatives Efficiency Enterprise	Not given	Nuffield Working with Science

PRESENT COMMERCIAL AFFILIATIONS:

Beginning in January 1977, units will be available by subscription scheme from Longmans, Ltd., York.

MATERIALS AVAILABLE FREE: Not answered

ADDITIONAL MATERIALS BEING DEVELOPED: Audio tapes, slide sets.

TEACHER PREPARATION:

Consultant Services: Consultant services available through Local Education Authority Science Advisers.

Pre-service and In-service Training: Area familiarization conferences at minimal cost.

Pre-service and In-service Teaching Materials: None

PROJECT EVALUATED:

Yes X No ___ Internal ___ External Agency X

Name of Outside Evaluators: J. K. Gilbert, IET, University of Surrey

Pertinent Research Studies: None, as yet.

In-House or Unpublished Research: Formative reports on each unit completing trial.

Availability of Evaluative Data: Not available, but inquiry welcomed.

PROJECT PUBLICITY: S. S. R. December 1976

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Publication and phase out during 1977-78.

PHYSICAL SCIENCES PROGRAM EXCHANGE (PSPE)

Department of Physical Sciences
The Polytechnic
Wolverhampton WV1 1LY
UNITED KINGDOM

Telephone: 0902-27371

Director: Graham Beech

Project Duration: 1972-1977

Age: 18+
Ability: average, above average
Subject: biol, chem, phys, ed. tech.
Language: English
Translations: none
Testing of Students: not answered

Materials Developed by Project:

Print	Non-Print
Newsletters Technical and user Documentation for each Program	Computer Programs

Types of Learning Experiences:
Not answered

PRINCIPAL PROFESSIONAL STAFF:

R. E. Maunder, Assistant

PROJECT HISTORY:

Principal Initiator(s): Graham Beech

Reason(s) for Project Initiation: Dissemination of computer-based materials.

PROJECT OBJECTIVES:

Overall Project Purpose: The Physical Sciences Program Exchange is a project within the National Development Program in Computer Assisted Learning. It is an organization concerned with the transferability and implementation of computer programs at reasonable costs within the post-secondary educational sphere. PSPE has members from universities and colleges throughout the UK, Europe and other countries.

Specific Objectives: PSPE operates by obtaining, testing and distributing copies of computer programs and related material among its members. Only programs with good quality documentation are accepted and PSPE ensures that they are tested in at least one other site, other than the originating institution, before being offered for general release. This is achieved by means of a reviewing service which is applied to all incoming programs.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: PSPE works at all levels of post-secondary science education, although we recognize that many programs in the library will be of interest to the secondary level. At present, the main subject areas are chemistry and physics but we plan to encompass materials science, biochemistry, polymer science and related areas in the near future.

Ways in which it differs from similar or previous programs: There is no similar scheme in the U K.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Programs relevant to the following areas are available:	Free	PSPE
Physics		
The Doppler effect		
Particle scattering		
Statistics and numerical methods		
Histogram plotting		
Polynomial fitting		
Simultaneous equations		
Minima of potential surfaces		
Non linear least squares		

PSPE (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material	Cost	Source
Organic Chemistry	Free	PSPE
Simulated qualitative analysis		
Atomic and Molecular Structure		
Orbital maps		
Dipole moments		
Molecular integrals		
Pi-electron theory		
Thermodynamics and Kinetics		
Electrochemical studies		
End point detection		
Kinetic parameters from calorimetry		
Formation constants from potentiometry		
Simulation of titrations		
Spectroscopy		
Mass Spectroscopy		
N M R simulation		
Data processing		
Crystal field theory		
Molecular parameters		
Nuclear and X-ray		
Isotope stock control		
Calculation of coordinates		
Fourier peak maxima		
X-ray simulation		
Polymer Science		
Molar masses		

The above are a representative selection from our library. There is a complete listing in the PSPE catalogue.

PRESENT COMMERCIAL AFFILIATIONS: Not answered

MATERIALS AVAILABLE FREE: All above materials available for postage cost only; newsletter.

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION: Not answered

PROJECT EVALUATED:

Yes ____ No ____ Internal X Incomplete External Agency ____

Availability of Evaluative Data: Write to Dr. Graham Beech, PSPE Project, Department of Physical Sciences, The Polytechnic, Wolverhampton WV1 1LY.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Continued additions to the program library.

SCHOOLS COUNCIL CITY SCENE PROJECT FOR THE LESS ABLE PUPIL

Science and Mathematics Centre
St. Luke's Road
Birmingham B5 7DA
UNITED KINGDOM

Telephone: U.K. 021-440-1625

Director: F. L. Darrall

Project Duration: 1975-1977

Age: 14-16
Ability: slow learner
Subject: biol, chem, phys
Language: English
Translations: none
Testing of Students: no formal evaluation

Materials Developed by Project:

Print	Non-Print
Activity Sheets Tchr. Manuals	Lab Equipment

Types of Learning Experiences:

- Independent Study
- Laboratory Activities
- Field Experiences
- Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Director, Mr. F. L. Darrall
secretary, technician, artists, writers (teachers seconded to project 1/2 day a week)

PROJECT HISTORY:

Principal Initiator(s): F. L. Darrall and local teachers

Reason(s) for Project Initiation: Problems of less able pupils in city of Birmingham schools following raising of statutory school-leaving age to 16.

Evolution and Development of the Project: The program was developed by science inspectors, teachers and centre staff concerned about problems of pupils not being entered for public examinations.

PROJECT OBJECTIVES:

Overall Project Purpose: To provide experiences so that the child will become knowledgeable and aware of himself, his environment and community; to produce resources that will help the child to develop his knowledge and skills through suggested activities and use of appropriate tools.

Specific Objectives: To produce resource material in the form of flow charts, worksheets and apparatus which science teachers may find useful for their older, less able children. The work shall be based on the City Scene. Topics covered are: Transport, Machines, Communications, Pollution, Wasteground, Safety, Structures, The Home.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Bottom eighth of ability range, ages 14-16

Ways in which it differs from similar or previous programs: Developed from ideas of a working party and locally based. Financed jointly by Schools Council and Local Education Authority (Birmingham, U. K.)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Trial, Worksheets, Equipment, and Teachers' Notes in all areas	Not available	Project

SCHOOLS COUNCIL CITY SCENE PROJECT (2)
FOR THE LESS ABLE PUPIL

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION:

Consultant Services: Initial meeting, Teachers' Notes, Visits by development team.

PROJECT EVALUATED:

Yes X No _____ Internal X External Agency _____

Pertinent Research Studies: Schools Council Project Brief, 160 Great Portland Street, London W1, U. K.

Availability of Evaluative Data: By personal visit.

PROJECT PUBLICITY: Listed in Schools Council Publications: Dialogue; Project Briefs

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE. Not answered

SIXTH FORM MATHEMATICS PROJECT (6FMC)

School Education
Reading University
London Road
Reading RG 1 5AQ
ENGLAND

Telephone: 0734 85234 EXT. 218

Director: Christopher Ormell

Project Duration: 1969-1978

Additional information, see also Clearinghouse Reports: 9.8.7

Age: 15-adult
Ability: all, average, above average
Subject: math
Language: English
Translations: none
Testing of Students: written achievement tests, teacher judgments student attitude q're

Materials Developed by Project:

Print	Non-Print
Textbooks	
Supplementary Books	
Newsletters	

Types of Learning Experiences:
Lecture
Seminar
Discussion
Independent Study

PRINCIPAL PROFESSIONAL STAFF:

John Morgan, David Malvern, Bridgid Sewell, Frank Knowles, Charles Bentley, Wilfred Flemming

PROJECT HISTORY:

Principal Initiator(s): Professor J. Wrigley, Schools Council

PROJECT OBJECTIVES:

Overall Project Purpose: To improve the quality of mathematics instruction for students aged 16-19.

Specific Objectives: A course of non-specialist mathematics suitable for students who have insufficient time or ability to attempt A-level.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: General mathematics students of 16 and older.

Ways in which it differs from similar or previous programs: 100% relevance while retaining intellectual challenge. No distinction is made between 'pure' and 'applied' mathematics.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (Cost not given)

Material		Source
1. Discussion unit	Mathematics Changes Gear (1975)	Heinemann
2. Starter units	Understanding Indices (1975) Geometry from Coordinates (1975) Introductory Probability (1975)	Heinemann
3. Continuation units	Calculus Applicable (1976) Logarithmic/Exponential (1975)	Heinemann
4. Newsletter	Polymetrics 9 to date, 1-5 out of print	6FMC

PRESENT COMMERCIAL AFFILIATIONS: Heinemann Educational Books, 48 Charles Street, London W1X 8AH, ENGLAND.

MATERIALS AVAILABLE FREE: Offprints of published articles. Some discussion papers.

ADDITIONAL MATERIALS BEING DEVELOPED:

Four more books will be published during 1976/7. It is hoped to issue a final report through the Schools Council.

TEACHER PREPARATION:

Consultant Services: W. Flemming, School of Education, Leicester University (coordinator 1976-78) available for consultation.

Pre-service and In-service Training: 1-Day workshop/Seminar at approximately monthly intervals. Annual residential Workshop at Reading.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Pertinent Research Studies: An Essay in Evaluation and Curriculum Development: 12 case studies, Macmillan 1973.

In-House or Unpublished Research: About 150 draft documents have been produced since 1969.

Availability of Evaluative Data: From the project secretary.

PROJECT PUBLICITY:

Mathematics Teaching 56, 1971
Dialogue 9, 1971
Dialogue 20, 1975
Physics Education 10, 1975
Times Educational Supplement April 23, 1976

PROJECT ACTIVITIES SINCE 1974 REPORT:

First set of six books published.
Examination adopted by London Board for general use.

PLANS FOR THE FUTURE:

An "After Care" Phase 1976-78.

TEACHING SCIENCE OUTDOORS

Department of Education
The University
Southampton S09 5NH
UNITED KINGDOM

Telephone: 0703 559122

Director: Peter Richmond
Project Duration: 1974-1977

Age: 12-15
Ability: average
Subject: biol, chem, phys, math
Language: English
Translations: none
Testing of Students: not answered

Materials Developed by Project:

Print	Non-Print
Tchr. Manuals	Lab Equipment

Types of Learning Experiences:
Discussion
Field Experiences

PRINCIPAL PROFESSIONAL STAFF: P. Parsons, Research Fellow

PROJECT HISTORY:

Principal Initiator(s): P. E. Richmond - The British Petroleum Co. Ltd. (BP).

Reason(s) for Project Initiation: A wish to exemplify the use of the school grounds and other outdoor environments in science teaching.

PROJECT OBJECTIVES:

Overall Project Purpose: The development and evaluation of teaching materials with a mathematical content, derived from scientific experiments out of doors.

Specific Objectives: To develop and evaluate science teaching materials in the following areas:

1. The identification of worthwhile areas of 'outdoor science' which allow systematic experimental study and analysis.
2. The development of appropriate methods of collection, analysis and presentation of the data and the conclusions.
3. A consideration of the suitability of the proposed experimental and mathematical methods for children working below O-level of the GCE.
4. The publication of a report which could be useful to teachers of science or mathematics.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students of average ability, ages 12-15

Ways in which it differs from similar or previous programs: Not an environmental science scheme but one where more conventional science schemes are improved and extended by work outside.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: None

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: Simple teacher's guides

TEACHER PREPARATION:

Consultant Services: Informal contacts only.

Pre-service and In-service Training: Incorporated into various science courses.

Pre-service and In-service Teaching Materials: None

TEACHING SCIENCE OUTDOORS

PROJECT EVALUATED:

Yes _____ No X Internal _____ External Agency _____

PROJECT PUBLICITY:

Teaching Science Outdoors - P. E. Richmond & P. Parsons
Times Educational Supplement 26 March 1976

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

DEVELOPMENT OF IDEAS IN MATHEMATICAL EDUCATION (DIME) PROJECT

Department of Education
University of Stirling
Stirling FK 9 4LA
SCOTLAND

Telephone: 07863171

Director: Geoff Giles

Project Duration: 1971-

Additional information, see also related project: Fife Mathematics Project, Scotland

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Age: 4-18+
Ability: all
Subject: math
Language: English
Translations: none
Testing of Students:
not applicable

Materials Developed by Project:

Print	Non-Print
Math Work Card Booklets Worksheets	Manipulatives

Types of Learning Experiences:
Discussion
Independent Study

PRINCIPAL PROFESSIONAL STAFF: No paid staff

PROJECT HISTORY:

Principal Initiator(s): Geoff Giles

Reason(s) for Project Initiation: To provide a structure for the development and production of new materials, manipulatives and apparatus for use in teaching mathematics.

Evolution and Development of the Project: DIME Projects produced pre-publication experimental material used by three mathematics projects sponsored by the Scottish Education Department. It makes available the original material devised by Geoff Giles for Fife Mathematics Project. More material is being prepared on an ad hoc basis as time and money allow.

PROJECT OBJECTIVES:

Overall Project Purpose: To provide a structure that enables ideas of potential value to be developed and put into a form that benefits pupils and students.

Specific Objectives: To provide materials that suit specific needs, e.g. material for individual work by pupils which incorporates considerable freedom of choice; interesting and stimulating situations; use of manipulatives whenever appropriate; emphasis on learning by absorbing; personal involvement of pupils.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Children aged 4 and above and adults, of all ability levels. Material is being used in a wide variety of schools, in particular Fife schools, London schools in the SMILE Project, and schools in Australia.

Ways in which it differs from similar or previous programs: Emphasis on a collection of separate items, so that interested teachers can use the particular items they wish in the way they decide. Emphasis on informality, simplicity, inexpensiveness, concept development, flexibility in use, student decisions.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
See DIME Projects Catalogue for materials produced and costs.		DIME Projects

PRESENT COMMERCIAL AFFILIATIONS:

Arrangements almost complete for commercial production of many items through Oliver and Boyd, Croythorne House, 23 Ravelston Terrace, Edinburgh EH4 3TJ

MATERIALS AVAILABLE FREE: Not answered

ADDITIONAL MATERIALS BEING DEVELOPED:

Probability Kits (available shortly)
Further booklets for use with Tess Tiles
Shape Tiles for use with younger children
Rotagrams
Overlays for making Tessellations

TEACHER PREPARATION:

Consultant Services: Informal advice only.

Pre-service and In-service Training: None

Pre-service and In-service Teaching Materials: None at present.

PROJECT EVALUATED: Not answered

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE:

1. To seek financial support so that more time can be spent on development and research.
2. To process the collection of projects and ideas that are stuck in the pipeline.

FIFE MATHEMATICS PROJECT

Department of Education
University of Stirling
Stirling FK 9 4LA
SCOTLAND

Telephone: 0786 3171

Director: Geoff Giles

Project Duration: 1969-

Additional information, see also Clearinghouse Reports: 9 and the related project: Development of Ideas in Mathematical Education (DIME), Scotland.

Age: 12-14
Ability: all
Subject: math
Language: English
Translations: none
Testing of Students:
  written achievement tests
  teacher judgments

Materials Developed by Project

Print	Non-Print
Work Card Booklets	Manipulatives
Worksheet	

Types of Learning Experiences:
- Discussion
- Independent Study

PRINCIPAL PROFESSIONAL STAFF: No paid staff

PROJECT HISTORY:

Principal Initiator(s): Geoff Giles

Reason(s) for Project Initiation: Teacher concerns about the teaching of mathematics to mixed ability classes in comprehensive schools.

Evolution and Development of the Project: Natural spread to most Fife secondary schools. Not imposed by Fife Education Authority.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop suitable materials and ways of working in the classroom that will increase the interest and involvement of all pupils in mathematical work, and that will enable individual pupils to work at speeds appropriate to their understanding and ability.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Mixed ability classes aged 12-14 in comprehensive schools.

Ways in which it differs from similar or previous programs: Greater emphasis on pupil responsibility and pupil choice, more informal material, greater use made of problem-oriented situations and simple, inexpensive manipulatives.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
See DIME Projects Catalogue for materials produced and costs		DIME

PRESENT COMMERCIAL AFFILIATIONS:

Arrangements almost complete for commercial publication of original booklet through Oliver and Boyd, Croythorn House, 23 Ravelston Terrace, Edinburgh EH4 3TJ.

MATERIALS AVAILABLE FREE: Not answered

ADDITIONAL MATERIALS BEING DEVELOPED: New booklets are now being written by teachers in Fife for use in the project in Fife. Further booklets in the Mathematics Workcard Booklets Series are at present being devised by Geoff Giles and will be available from April 1976 through DIME Projects.

TEACHER PREPARATION:

Consultant Services: Informal advice only.

Pre-service and In-service Training: None

Pre-service and In-service Teaching Materials: None

PROJECT EVALUATED:

Yes X No ____ Internal ____ External Agency X

Name of Outside Evaluators: Godfrey Thomson Unit for Academic Assessment

Pertinent Research Studies: None

In-House or Unpublished Research: On a formal test of the traditional type, the pupils involved in the project performed no worse than the others. Teachers were in agreement that pupil attitude and involvement was better.

Availability of Evaluative Data: Not yet.

PROJECT PUBLICITY:

The Fife Mathematics Project: An Experiment in Individualized Learning, D. H. Crawford, Oxford University Press 1975

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Continuing development of material and methods.

FURTHER AND HIGHER EDUCATION SERVICE
MATHEMATICS (MATLAB)

Napier College of Commerce
and Technology
Colinton Road
Edinburg EH10 5DT
SCOTLAND

Director: D. F. Leach

Project Duration: 1972-1977

Telephone: 031-447-8262 or 031-447-7070

Age: 17-adult
Ability: average
Subject: math
Language: English
Translations: none
Testing of Students:
written achievement test,
lab performance tests

Materials Developed by Project:

Print	Non-Print
Lab Books	Overhead Trans.
Tchr. Manuals	Videotape
Overview	Slide tape
Newsletters	

Types of Learning Experiences:
- Lecture
- Lab Activities
- Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

John A. Hampton - Project Manager
John R. Foster - Evaluation Director
Ken Barclay - Programming Manager
Norman Ferguson - Local Coordinator - Falkirk
Ian Miller - Local Coordinator - Paisley

PROJECT HISTORY:

Principal Initiator(s): Donald F. Leach and John A. Hampton

Reason(s) for Project Initiation: To assist students having difficulty with understanding and using Mathematics as a service subject (e.g. in Engineering, Business Studies).

Evolution and Development of the Project: The project was originally a Feasibility Study FS1/01 1 Dec, 1973 to 30 June 1975 within the National Development Programme in Computer Assisted Learning. Initially it involved Napier College of Science and Technology, Edinburgh, College of Commerce and Falkirk Technical College. Since July 1, 1975 it has involved Napier College of Commerce and Technology, Falkirk College of Technology and Paisley College of Technology.

PROJECT OBJECTIVES:

Overall Project Purpose: To provide a laboratory of frequently used mathematics processes to assist with the teaching/learning of Service Mathematics.

Specific Objectives:

a) Educational - To enable students to shift attention to the construction of mathematical models and the validation of the solution of these models; the computer and written course materials to have a modular structure so that adoption for use with a variety of syllabuses is facilitated.

b) Financial - To implement MATLAB at a cost per student comparable with that for the provision of elementary courses in computer programming for students on these or similar courses.

c) Technological - To develop the MATLAB interactive programs so that a range of facilities covering the needs of the courses can be provided either on a mini-computer or on a commercial multi-access system.

d) User Facilities - To provide for linkage of statements and storage of student written packages and/or data.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Certificate, Diploma and Degree courses in Science, Engineering and Commerce.

Ways in which it differs from similar or previous programs: MATLAB is a suite of easy to use 'programs' covering a wide range of frequently used mathematical processes. The interface between student and computer is minimal and mathematically orientated, thus eliminating the need to use a conventional programming language.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Packages and self-instructional teaching manuals for: Graphing mathematical expressions Evaluating mathematical expressions Tabulating mathematical expressions Definite integration Matrix Manipulation e.g. multiplication, inverse Statistical manipulations e.g. histogram, mean, binomial probabilities Teacher guide giving an overview of the system	Reproduction and postage	MATLAB

PRESENT COMMERCIAL AFFILIATIONS: Not answered

MATERIALS AVAILABLE FREE:

Single copies of self instructional manuals.

ADDITIONAL MATERIALS BEING DEVELOPED:

Additional self-instructional teaching manuals

TEACHER PREPARATION:

Consultant Services: Project staff.

Pre-service and In-service Training: Staff seminar - no additional finance involved, carried out as part of normal duties.

Pre-service and In-service Teaching Materials: Self-instructional manuals on the use and application of computing materials, and teacher guide giving an overview of the system. Cost - at cost of reproduction.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Pertinent Research Studies: None

In-House or Unpublished Research: Two short reports have been written. The first describes the amount of use and the problems associated with the use of the computer assisted materials. The second report is an account of project team activity over a specified time.

Availability of Evaluative Data: Developmental testing of new materials is scheduled and data will be available shortly.

MATLAB (3)

PROJECT PUBLICITY:

D. F. Leach - A computer-based laboratory for service mathematics teaching, Proceedings of International Conference on Frontiers in Education 1974.

J. A. Hampton - Service Mathematics Teaching using a Computer-Based Laboratory. Paper presented at "Computers in Higher Education 1976" Loughborough Conference 24-26 March 1976.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Project has achieved Development Status (as of July 1, 1975) from previous Feasibility Study with increased grant and staffing. Computer time previously bought from outside agency now provided by in-house C.T.L, Modular I computer at Napier College and Burroughs B5700 at Paisley College.

PLANS FOR THE FUTURE·

Developing additional manuals
Statistical facilities for use commencing September 1976
Operational Research facilities for use commencing September 1977
Plans to investigate mathematical problem solving for Engineers

MATHEMATICS FOR GENERAL EDUCATION (M.G.Ed)

National Curriculum Centre
for Mathematics, Science and
Technical Education
Gardyne Road
Broughty Ferry
Dundee DD5 1NY, SCOTLAND

Telephone: Dundee 455053

Director: J. Nisbet

Project Duration: -1978

Additional information, see also
Clearinghouse Reports: 9

Age: 14-16
Ability: slow learner
Subject: math
Language: English
Translations: none
Testing of Students:
teacher judgments
and continuous
assessment

Materials Developed by Project:

Print	Non-Print
Textbooks & Booklets	Games
Supplementary Books	
Activity Sheets	
Behavioral Objectives	
Overview	

Types of Learning Experiences:

Flexible:
Discussion
Individual work
Small Group work

PRINCIPAL PROFESSIONAL STAFF:

J. Nisbet, Chairman
H. Martin, Secretary

John A. R. Hughes, Director
Scottish Centre for Mathematics, Science and
Technical Education

PROJECT HISTORY:

Principal Initiator(s): Scottish Education Department

Reason(s) for Project Initiation: Lack of available material for non-certificate pupils.

Evolution and Development of the Project:

Initiation by Scottish Education Department, formation of committee, planning, writing, testing in schools, rewriting, distribution and revision of commercial publisher.

PROJECT OBJECTIVES:

Overall Project Purpose: To provide materials for slow-learning pupils, non-certificate pupils in mathematics that would supplement the materials already available commercially.

Specific Objectives: To produce 100 units varying in length to assist in the development of basic mathematical skills and covering a wide range of topics to interest and stimulate pupils.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Non-certificate pupils aged 14-16 in mathematics.

Ways in which it differs from similar or previous programs: Wide range of materials that allow pupil and/or teacher selection according to interest and ability.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
100 Units in wide variety of formats- worksheets, booklets, apparatus	Not given	Macmillan Education
Occasional paper No. 2 "Mathematics for General Education"	30p	Scottish Centre for mathematics Science and Technical Education

PRESENT COMMERCIAL AFFILIATIONS:

Macmillan Education, Houndmills, Basingstoke, Hampshire, England

MATERIALS AVAILABLE FREE:

One copy of each to all secondary schools in Scotland from M.G.Ed.

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION:

Consultant Services: Frequent meetings with principal teachers or their representatives. In-service courses.

Pre-service and In-service Training: Colleges introduce the materials to students but this is not compulsory. In-service courses arranged by Scottish Education Department, colleges or mathematics advisers.

Pre-service and In-service Teaching Materials: All materials available. Cost not yet fixed for commercial version.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Availability of Evaluative Data: Assessment sheets have been collected from all trial schools but these are available only by special arrangement. Summaries of some aspects are more widely available.

PROJECT PUBLICITY:

There have been only brief mentions of the program because the commercial version will not be available until this summer and has therefore not been reviewed yet.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Writing units, testing, rewriting, commercial development.

PLANS FOR THE FUTURE:

Committee members to visit trial schools for comments and discussion. Evaluation by assessment sheets and teacher comments. In-service courses. Commercial publication.

SCIENCE IN S1 AND S2

Scottish Centre for Mathematics,
Science and Technical Education
College of Education
Gardyne Road
Dundee DD5 1NY
SCOTLAND
Telephone: DUNDEE 455053

Director: J. A. R. Hughes

Project Duration: 1973-1977

Age: 12, 13
Ability: all
Subject: biol, chem, phys
Language: English
Translations: none
Testing of Students:
written achievement, lab performance and oral tests; standardized tests, teacher judgments

Materials Developed by Project:

Print	Non-Print
Activity Sheets	Slides
Tchr. Manuals	Overhead Trans.
Eval. Materials	
Behavioral Objectives	

Types of Learning Experiences:
Discussion
Independent Study
Lab Activities
Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

J. A. R. Hughes, Director
A. Johnston, Chairman of Working Party
Dr. S. Kellington, Evaluator

PROJECT HISTORY:

Principal Initiator(s): Scottish Central Committee on Science

Reason(s) for Project Initiation: Up-dating teaching/learning material for the Scottish Integrated Science Course.

Evolution and Development of the Project: There arose a need to revise the pupil material available and to offer help to more teachers who had to teach mixed-ability classes in comprehensive schools.

PROJECT OBJECTIVES:

Overall Project Purpose: To structure the Scottish Integrated Science Course to help science teachers who teach either mixed ability classes or classes of low ability pupils in the first two years of secondary education in Scottish schools. The Working Party has established aims and objectives for three groups of pupils within an unstreamed class, selected suitable content and learning experiences for these groups and set up a complex two year evaluation program (now in its second year).

Specific Objectives: The objectives proposed for science education in the first two years of secondary schooling are the same for all pupils; that is, to assist those pupils towards: 1) a better understanding of themselves and their empirical environment; 2) an improvement in their communication skills; 3) an ability to solve problems and to think scientifically, 4) development of some attitudes which are required for good personal and social relationships, and 5) an awareness of the culture which is science.

Different sets of objectives are stated for three groups of pupils (the less-able, the average and the most-able pupils). Three types of objectives are being established for each pupil group: 1) course objectives, which are general objectives for the whole two year course; 2) section objectives, which describe the goals for each of the fifteen sections of the course; 3) expected outcomes, which are really lesson objectives and are the most specific of the three types.

SCIENCE IN S1 AND S2 (2)

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All children, in normal schools, between ages of 12 and 14. S1 and S2 denotes first and second year classes in Scottish Secondary Schools.

Ways in which it differs from similar or previous programs: The program offers teachers a choice of materials suited to the interests and/or abilities of individual pupils, including core activities for all pupils with extensions and options for remediation and enrichment.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Materials	Cost	Source
Work sheets and work cards for pupils	Not Given	Project
Teachers' Guides to each section of the course	Not Given	Project

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: A few samples, by arrangement with the Project Director.

ADDITIONAL MATERIALS BEING DEVELOPED:

Report to Scottish Central Committee on Science containing a statement of the philosophy of the Working Party with particular reference to group methods of teaching, laboratory organization, the specific objectives and evaluation/assessment.

TEACHER PREPARATION:

Consultant Services: Conferences of teachers in pilot schools. Visits to schools by Centre staff, H.M. Inspectors of schools.

Pre-service and In-service Training: Single copies of all trial material are distributed to every secondary school and teacher-training establishment in Scotland.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Pertinent Research Studies: None, as yet.

In-House or Unpublished Research: None, as yet.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE:

Following the 1975-76 trials the Working Party will produce final versions of the worksheets and teachers' guides for each section. We hope to have the materials for the first few sections in year 1 and year 2 ready before the summer of 1976. We also propose to publish from the Scottish Centre for Mathematics, Science and Technical Education an informative report on the course by summer 1976, and a general teachers' guide by Christmas 1976. It is anticipated that a commercial version of the material will be available some time in 1977. A publisher will be selected by May 1976.

SCOTTISH EDUCATION DEPARTMENT
MATHEMATICS EXPERIMENT

Scottish Centre for Mathematics,
Science and Technical Education
College of Education
Gardyne Road
Dundee DD 5 1NY
UNITED KINGDOM

Telephone: Dundee 455053

Director: J. Nisbet

Project Duration: 1970-1977

Additional information, see also
Clearinghouse Reports: 9, 8

Age: 13-16
Ability: Grades 7-8, all; Grades 9-10, average and above average
Subject: math
Language: English
Translations: none
Testing of Students:
- written achievement tests
- standardized tests
- teacher judgments

Materials Developed by Project:

Print	Non-Print
Activity Sheets	Overhead Trans.
Eval. Materials	Lab Equipment

Types of Learning Experiences:
- Discussion
- Independent Study

PRINCIPAL PROFESSIONAL STAFF:

J. Nisbet and W. Mein, H.M. Inspectors of Schools

PROJECT HISTORY:

Principal Initiator(s): Scottish Education Department.

Reason(s) for Project Initiation:

For Grades 7,8: To provide work and materials suitable for mixed ability classes in comprehensive schools.

For Grades 9,10: To provide a terminal course (at age 16) for pupils who do not require to study mathematics any further.

Evolution and Development of the Project: Materials for grades 7,8 completed June 1974. Materials for grades 9, 10 to be completed June 1977 or later.

PROJECT OBJECTIVES:

Overall Project Purpose: To devise a course in mathematics which is suitable for the needs of pupils who do not, in the first instance, propose to continue the study of mathematics beyond the Ordinary Grade of the Scottish Certificate of Education. The course is primarily concerned with providing a mathematical education for non-specialists but is devised in such a way as to permit students who so wish to carry the subject further.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Mixed ability classes in comprehensive schools for grades 7 and 8 (ages 13,14).

Ways in which it differs from similar or previous programs: Material for grades 7,8 is designed for mixed ability classes in a comprehensive school. There is emphasis on the use of apparatus. It is divided into a series of modules, each of which is the development of a particular mathematical topic. To provide for variations in ability, a module consists of four sections, designed to cover the 'O' grade syllabus, and provide remediation and enrichment.

SCOTTISH EDUCATION DEPARTMENT (2)
MATHEMATICS EXPERIMENT

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
For Grades 7 and 8: "Modular Mathematics"	not given	Heinemann
For Grades 9 and 10: Learning Units:	not given	Project Director

1. Similarity
2. Variation
3. a x 10^n + decimals
4. Vectors
5. Standard Deviation
6. Foreign Exchange
7. Linear Equations and Inequations
8. Heights and Distances
9. Probability
10. Binomial Distribution
11. Functions
12. Spending Money
13. Periodicity
14. The Straight Line
15. BASIC I
16. Normal Distribution
17. Graphs
18. Formulae
19. Equations and Inequations in Two Variables
20. Normally Binomial
21. Borrowing and Saving
22. Transformations
23. Trigonometry
24. BASIC II
25. Sampling
26. Interpreting Graphs
27. Rates and Taxes
28. Decision Making
29. Approximate Solutions
30. Pictorial Representation

PRESENT COMMERCIAL AFFILIATIONS:

Heinemann Educational Books Ltd.
48 Charles Street
London W1. ENGLAND

MATERIALS AVAILABLE FREE:

A few samples by arrangement with the Director, Scottish Centre for Mathematics, Science and Technical Education.

ADDITIONAL MATERIALS BEING DEVELOPED: Not Answered

TEACHER PREPARATION:

Consultant Services: The materials for Grades 9 and 10 are only available in full to pilot schools and only pupils from pilot schools are permitted to sit the examination, prepared by the Scottish Certificate of Education Examination Board, at the end of the course. This will continue until the end of the trial period. Teachers involved in the trials meet at intervals. Inspectors of schools and members of the writing team are available for consultation by these teachers.

Pre-service and In-service Training: Colleges of Education provide in- and pre-service courses on the grades 7 and 8 "Modular Mathematics" material.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

PROJECT PUBLICITY: None

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not Answered

EARLY STAGES OF MATHEMATICAL DEVELOPMENT WITH YOUNGER CHILDREN (3 YEARS TO 9 YEARS)

"Rockleigh"
Edwardsville, Treharris
Mid-Glam CF46 5ND
Wales
UNITED KINGDOM

Telephone: Treharris 338

Director: W. J. Norman Emery

Project Duration: 1974-1978(80)

Additional information, see also Clearinghouse Reports: 9, 8, 7 and the 20-Year Cumulative Directory for related title.

Age: 3-9
Ability: all
Subject: math
Language: English
Translations: none
Testing of Students:
specific aims/objectives list, oral and written achievement tests

Materials Developed by Project:

Print	Non-Print
Activity Sheets	Slides
Tchr. Manuals	Games
Overview	

Types of Learning Experiences:
Activity/Experience Approach

PRINCIPAL PROFESSIONAL STAFF:

Headteachers (Principals) and teachers in various schools

PROJECT HISTORY:

Principal Initiator(s): W. J. Norman Emery

Reason(s) for Project Initiation: Following the completion of the "Valley Project in Primary Mathematics" 1968-1974, it became evident that the early years of mathematical development were all important, and that these years needed to be examined in some depth.

Evolution and Development of the Project: The project began with an examination of the mathematical needs of the young pre-school child; and is continuing progressively through later age groups.

PROJECT OBJECTIVES:

Overall Project Purpose: The overall purpose of the project is to examine closely the early stages of mathematical development, so that a sound foundation will ensure better understanding and more enjoyable learning in later years.

Specific Objectives:

1. To encourage sound attitudes to mathematics learning.
2. To encourage the growth of mathematics understanding through suitable activities and experiences.
3. To examine basic concepts, and ways in which these may be grasped.
4. To analyze ways of organizing the learning of mathematics.
5. To suggest a progressive approach to early mathematics learning.
6. To look at mathematics and the Open Classroom within an integrated approach.
7. To devise a system of assessment and record keeping.
8. To examine the use of language; and ways of acquiring a knowledge of basic facts.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Full coverage of age range with miscellaneous backgrounds.

Ways in which it differs from similar or previous programs:

1. Emphasis on activity/experience approach.
2. Examines organization, including materials, to cater to individual needs.
3. Emphasis on assessment techniques and record keeping.
4. Deals in particular with the causes of later confusion.
5. Covers all aspects of mathematics in different learning organizations within the classroom situation--particularly the open classroom.
6. Examines the special needs of the teacher in teaching mathematics to younger pupils.

EARLY STAGES OF MATHEMATICAL DEVELOPMENT WITH YOUNGER CHILDREN (3 YEARS TO 9 YEARS) (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
The learning environment: allocation of materials and learning areas for mathematics in the classroom	Not Given	Materials will soon be available for purchase, inquiries should be made through project director.
Vocabulary lists for language development	Not Given	
Organizational plans for mathematics activities	Not Given	
Progressive activities through learning stages	Not Given	
Teacher guidelines covering mathematics progressions in all aspects	Not Given	

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

1. Slides, tapes
2. Diagnostic tests for teacher use
3. Assessment/record keeping charts
4. Mathematical use of basic materials
5. Book covering details of approach to mathematics (3 years to 9 years)

TEACHER PREPARATION:

Consultant Services: Teachers advised on use of materials. Consultant services of Project Director available.

Pre-service and In-service Training: Lectures, seminars, workshops at pre-service and in-service levels. Costs covered by public and individual private funds. Extent of costs dependent upon fees and duration of activity.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

In-House or Unpublished Research: A substantial amount of material has been prepared to date, but not yet complete.

Availability of Evaluative Data: Write to Project Director.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT:

The Project has received the cooperation of many teachers in schools over a wide area.

PLANS FOR THE FUTURE:

In addition to other materials, the project intends to publish a book. The present method of project development is to continue--it is hoped that parents as well as teachers will be involved.

OPI MATHEMATICAL REFORM PROJECT

OPI Matematika Tanszék
1406 Budapest
P. O. Box 35
HUNGARY

Telephone: 428-581

Director: E. Hődi

Project Duration: 1963-

Additional information, see also
Clearinghouse Reports: 4, 5, 6, 9

Age: 5-14
Ability: all
Subject: math
Language: Hungarian
Translations: none
Testing of Students:
  written achievement tests,
  teacher judgments
  student attitude q're

Materials Developed by Project:

Print	Non-Print
Activity Sheets	Films
	Games

Types of Learning Experiences:

- Discussion
- Independent Study
- Televised Lessons

PRINCIPAL PROFESSIONAL STAFF: Not answered

PROJECT HISTORY:

Principal Initiator(s): T. Varga

Reason(s) for Project Initiation: Spreading new mathematical curricula, using appropriate approaches, throughout the whole country, to supplant the former ones which gradually became obsolete.

Evolution and Development of the Project: During the 13 years of its existence, the number of teachers and classes involved has increased from two to several hundred. A nationwide curriculum was provisionally adopted in 1974 by the government, based on the work of this project. It is expected to be approved for the next 15 years in 1976, and gradually implemented to reach the coverage of every school in the country in each grade by 1986.

PROJECT OBJECTIVES:

Overall Project Purpose: Developing and implementing curricula integrating mathematical topics which are found to be fundamental and feasible at the various levels. Searching ways of integrating or at least coordinating mathematics with other school subjects.

Specific Objectives: Developing and publishing student worksheets, teacher manuals, in-service training materials for teachers.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: The whole school population up to completion of general school (14-15).

Ways in which it differs from similar or previous programs: The program starts in grade 1 with each of the fields of mathematics it includes by the end of the proposed curriculum: sets; logic; relations; functions; numbers; algebra; geometry; measurements; combinatorial mathematics; probability; statistics.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
First draft for grades 1 through 4		
New versions for grades 1 and 2		
First draft for grades 5 and 6 (transitional)		
Guides for grades 1 and 2, also grades 5 and 6 (transitional)		
Textbooks for grades 5 and 6 (transitional)		

PRESENT COMMERCIAL AFFILIATIONS: Tankönyvkiadó, Budapest

MATERIALS AVAILABLE FREE: None

OPI MATHEMATICAL REFORM PROJECT (2)

ADDITIONAL MATERIALS BEING DEVELOPED:

Textbooks, worksheets and teacher guides for grades 3, 4, 7, 8 (7 and 8 transitional).

TEACHER PREPARATION:

Consultant Services: In twenty in-service **training** centres all over the country and in teacher training colleges, teachers have regular consultant services.

Pre-service and In-service Training: The in-service training centres have their own budgets. Costs vary from year to year. The trend is toward increasing costs.

PROJECT EVALUATED:

Yes X No ____ Internal ____ External Agency X

Name of Outside Evaluators: A team composed of independent educators, psychologists and statisticians.

Pertinent Research Studies: S. Klein, Pedagogical Institute, Technical University, Budapest, has published a number of research studies.

Availability of Evaluative Data: None

PROJECT PUBLICITY: None in languages other than Hungarian.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Work on the development and implementation of the new curricula.

PLANS FOR THE FUTURE:

First steps toward revision of the new curricula to take place after 1990.

INTEGRATED SCIENCE CURRICULUM INNOVATION PROJECT (ISCIP)

Curriculum Development Unit
Trinity College
28 Westland Row
Dublin 2, IRELAND

Telephone: Dublin 772941 EXT. 550/715

Director: Bride Rosney

Project Duration: 1972-1976

Additional information, see also Clearinghouse Reports: 9

Age: 12-15
Ability: all
Subject: biol, chem, phys, eng/tech
Language: English
Translations: none
Testing of Students:
written achievement tests, lab performance tests, teacher judgment, student attitude q're

Materials Developed by Project:

Print	Non-Print
Programmed Units	
Activity Sheets	
Tchr. Manuals	
Field Guides	
Eval. Materials	

Types of Learning Experiences:
- Discussion
- Lab Activities
- Field Experiences

PRINCIPAL PROFESSIONAL STAFF:

Teacher Representative Committee (15 teachers)
Evaluator - Bernard O'Flaherty
Teachers on Release

PROJECT HISTORY:

Principal Initiator(s): B. L. Powell

Reason(s) for Project Initiation: Need for integrated approach at secondary level.

Evolution and Development of the Project:

1972/73 Feasibility study with 7 schools.
1973/76 Three year program with 15 schools. Terminal state examination of students June 1976.

PROJECT OBJECTIVES:

Overall Project Purpose: To stimulate development of student's natural interests and aptitudes. To develop the ability of critical thinking and analysis. To provide the student with an understanding of science and its relationships to quality of life.

Specific Objectives:

1. Behavior - a function of teaching method and of teacher-student relationships.
2. Knowledge - emphasis on understanding.
3. Awareness - of significance of Science.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students aged 12-15 of the city of Dublin Vocational Education Committee Schools - many students of working class backgrounds - varying abilities.

Ways in which it differs from similar or previous programs: Integrated, practical approach - not usual in Ireland.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Teacher's handbook/manual	Free	ISCIP
Catalogue of all student materials	Free	ISCIP

ISCIP (2)

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: Teacher Handbook and Materials Catalog, based on availability.

ADDITIONAL MATERIALS BEING DEVELOPED: Expansion and rewriting of existing materials.

TEACHER PREPARATION:

Consultant Services:

1. Regular in-service programs on specific topics.
2. School visits by unit personnel.
3. Representative committee of teachers meets bi-weekly.

Pre-service and In-service Training: Release of teachers for in-service training - costs borne jointly by unit and pilot schools.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Pertinent Research Studies: Dublin University Master's thesis by E. E. Oldham.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

INIZIATIVA RELATIVITA (IR)

Seminario Didattico della
Facolta di Scienze
Via A. Tari 3
80138 Napoli
ITALY
Telephone: 081.315180

Director: Giulio Cortini

Project Duration: 1970-1976

Additional information, see also the 20-Year Cumulative Directory for title change.

Age: 16-18
Ability: all
Subject: phys
Language: Italian
Translations: none
Testing of Students:
written achievement tests,
standardized tests,
teacher judgments

Materials Developed by Project:

Print	Non-Print
Textbooks	Lab equipment
Tchr Manuals	
Eval. Materials	

Types of Learning Experiences:
Discussion
Lecture
Audio/Visual
Lab Activities

PRINCIPAL PROFESSIONAL STAFF:

G. Cortini, S. Bergia, C. Fusco, L. Nuvoli, B. Palma Vittorelli, G. Segré, R. M. Sperandeo, N. Tomasini Grimellini, M. Corda Costa and A. Visalberghi

PROJECT HISTORY:

Principal Initiator(s): Giulio Cortini

Reason(s) for Project Initiation: "Modern" physics was (and generally is) completely ignored in pre-university Italian schools. A first attempt of curriculum development, with the teaching of Special Relativity as an outstanding feature, seemed to be meaningful.

Evolution and Development of the Project: Three large Conferences of research workers and teachers were held from autumn 1971 to spring 1973 in order to determine details of the project. Single partial attempts were made by several teachers in their classes since 1971/72. A systematic pedagogical experiment was begun in 1973/74 and will be completed in 1975/76.

PROJECT OBJECTIVES:

Overall Project Purpose: To bring some elements of "modern" physics into Italian schools. To make a first attempt at a national effort in the curriculum development field.

Specific Objectives:

To test the possibility of bringing a modified curriculum, including a significant coverage of Special Relativity into the present classes of Italian secondary schools.

To test the assumption that the proposed curriculum changes will produce useful results in the field of physics education.

To provide Italian teachers with a detailed curriculum including Special Relativity and with appropriate guides and teaching materials.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Pupils of Italian Liceo Scientifico (ages 16-18). This means a somewhat higher than average socio-economic background.

Ways in which it differs from similar or previous programs: No systematic curriculum development project exists in Italy at the same age level.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Pupils texts:		
M.A. Valenza (Palermo) - Introduzione alla Relativita Galileiana	Unknown	Arti Grafiche Siciliane, Palermo
G. Dal Pozzo et al. (Torino) - Gravitazione Universale e Sistema Solare attraverso le sue Fasi Storiche	1,000 lire	Casa Editrice Levrotto & Bella, Torino
G. Cortini (Napoli) - I Fondamenti sperimentali della Relatività Ristretta	650 lire	Liguori Editrice, Napoli
S. Bergia (Modena)- La Storia della Relatività. Estratto da "La Fisica nella Scuola", 8, 1, 1975.	1,500 lire	C. Bonacini, Presidente dell' AIF, Istituto di Fisica dell'Università di Modena
Texts for optional group work of pupils:		
G. Segrè (Napoli) - La deduzione delle Trasformazioni di Lorentz col K-calcolo	Not Given	IR
A. Cellerino et al (Napoli) - La Dinamica Relativistica	"	"
Teacher guide and readings:		
M. Antonini et al. (Napoli) - Guida per gli insegnanti	"	"
G. Cortini e C. Fusco (Napoli) - Introduzione al paradosso dei gemelli	"	"
A. Saponi e G. Tomasini (Bologna) - Complementi sulle Leggi di Conservazione	"	"
Evaluation media :		
E. De Forgellinis et al. (Bologna, Napoli, Palermo) - Questionari sulla Comprensione della Fisica	"	"
E. De Forgellinis et al. (Napoli) - Questionari sulla Relatività	"	"
Mary Del Vecchio, B. Palma Vittorelli, R. Sperandeo, M. A. Valenza (Palermo) - Questionario sui processi operativi della scienza	"	"
Apparatus:		
Measurements on relative motions	"	"
Measurements of short time intervals with the oscilloscope	"	"

PRESENT COMMERCIAL AFFILIATIONS:

Arti Grafiche Siciliane, Palermo
Casa Editirce Levrotto e Bella, Via Torino
Casa Editrice Liguori, Via Mezzocannone, 19 - 80134 Napoli
C. Bonacini, Presidente dell'AIF, Istituto di Fisica dell' Università - Modena (Italy)

MATERIALS AVAILABLE FREE: Iniziativa Relatività, a progress report, June 1975.

ADDITIONAL MATERIALS BEING DEVELOPED:

A revised version of the whole material, to be collected in a single series of short books.

TEACHER PREPARATION:

Consultant Services: Each teacher is in touch with one of the interested university groups.

Pre-service and In-service Training: Two meetings are held each year, with the financial support of the Ministry of Education. The whole project is financed by the Società Italiana di Fisica and the Istituto Nazionale di Fisica Nucleare.

Pre-service and In-service Teaching Materials: Teacher's guides and readings.

PROJECT EVALUATED:

Yes X No _____ Internal X External Agency _____

Pertinent Research Studies: M. G. Del Vecchio, M. B. Palma Vittorelli, R. Sperandeo Minneo, M. A. Valenza "Il problema della valutazione in relazione agli obiettivi dell'educazione scientifica", Giornale di Fisica, Vol. XV, n.1, Gennaio-Marzo 1974.
Questionario sui prccessioperativi nella scienza, Quaderni T.P.O.

PROJECT PUBLICITY:

G. Cortini, An Experiment on the Teaching of Special Relativity in the Italian Secondary Schools. Report at the GIREP Conference, Venezia 1973
G. Cortini, Iniziativa Relatività, A Progress Report, June 1975, presented at the Edinburg Conference, August 1975.

PROJECT ACTIVITIES SINCE 1974 REPORT:

The pedagogical experiment has been going on in 12 classes.

PLANS FOR THE FUTURE:

A general report will be published after the completion and analysis of the feedback data. A revised version of all the produced materials will be prepared in a single series of short books in order to provide Italian teachers with the appropriate guides and teaching materials.

THE STRUCTURE OF MATTER (AN ACTIVITY BASED SCIENCE COURSE)

Professor R. M. Spernadeo-Mineo
Instituto di Fisica dell'Università
Via Archirafi 36,
90123 Palermo
ITALY

Telephone: 091/235694

Director: M. B. Palma Vittorelli

Project Duration: 1973-1978

Additional information, see also Clearinghouse Reports: 8 and the 20-Year Cumulative Directory for title change.

Age: 14, 15
Ability: all
Subject: biol, chem phys
Language: Italian
Translations: none
Testing of Students: written achievement tests, oral tests, teacher judgment

Materials Developed by Project:

Print	Non-Print
Textbooks	
Lab Books	
Eval. Materials	

Types of Learning Experiences:

Discussion
Independent Studies
Lab Activities

PRINCIPAL PROFESSIONAL STAFF:

Prof. R. M. Sperandeo-Mineo, Physicist
Prof. M. L. Vittorelli, Biologist
Prof. M. L. Aiello Nicosia, Physicist
Prof. M. A. Valenza, Physicist
Dr. A. Cestelli, Biologist

PROJECT HISTORY:

Principal Initiator(s): Director and professional staff

Reason(s) for Project Initiation: To change the teaching methods and contents of science courses in connection with a forthcoming extension of compulsory schooling age from 14 to 16 years.

Evolution and Development of the Project: This project is the continuation of the project "Activity Based Physics Course" which appeared in the Eighth International Clearinghouse Report. From 1974, relevant changes have been introduced. The Course now covers not only Physics, but Integrated Science. At present the first part of the Course is in a trial edition. Feedback from a two years experimentation will be collected, as a basis for a revised edition. The second part of the course is in first developmental stage.

PROJECT OBJECTIVES:

Overall Project Purpose: The fundamental aim of the Course is the understanding and use of science processes in order to stimulate in students the transition from concrete to formal thinking.

Specific Objectives: a) To stimulate the learning of the abilities connected with operational processes of Science.
b) To stimulate the learning of some unifying concepts of science (like mass, volume, energy, model, interaction, etc.).
c) To understand the role of science in the historical development of humanity.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All levels of compulsory school, ages 14-16.

Ways in which it differs from similar or previous programs: The content is organized in the course to achieve a good coordination among Physics and Biology. The structure of the course is that of an investigation, proceeding gradually from macroscopic systems to microscopic components. Living and non-living systems are separated into simpler subsystems using different criteria: non-living

THE STRUCTURE OF MATTER (AN ACTIVITY BASED
SCIENCE COURSE) (2)

UNIQUE CHARACTERISTICS OF THE PROJECT:

Ways in which it differs from similar or previous programs: (continued) systems are taken into parts according to different properties of components; living systems are taken apart according to the different functions of the subsystems.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
25 learning units including: 12 physical science 12 biology 1 introductory	Free	Project

(Units include guide to experiments, technical instructions and guide to class discussion.)

PRESENT COMMERCIAL AFFILIATIONS: Not answered

MATERIALS AVAILABLE FREE: See Materials Already Produced, Including Sources and Costs.

ADDITIONAL MATERIALS BEING DEVELOPED: Guides for teachers, reading books.

TEACHER PREPARATION:

Pre-service and In-service Training: Teachers of the pilot-classes usually attend a course in which they get acquainted (through working groups, seminars and classes) with the material they are going to teach. We will be studying teaching materials for "ad hoc" in-service training of many more teachers.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Pertinent Research Studies:

1. S. Mannino, M. B. Palma-Vittorelli, R. M. Sperandeo-Mineo: "Reports of GIREP Conference", Venezia 1973, in print, page 102.
2. M. Del Vecchio, M. B. Palma-Vittorelli, R. M. Sperandeo-Mineo, M. A. Valenza: "Giornale di Fisica" XV, 1, (1974)

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Three in-service courses for teachers to prepare for an experiment in a few pilot classes.

PLANS FOR THE FUTURE: Revision after feedback from the pilot experimentation and publication of the first edition. In-service preparation of teachers for more diffusion of the Project.

ACHIEVEMENT TESTS FOR PHYSICS, MATH AND CHEMISTRY

Dutch Institute for Test Development
CITO
65 Oeverstraat
Arnhem,
THE NETHERLANDS

Telephone: 085-455555

Directors: P.K.H. Broekman, G. Bakker, and H. Schouten

Project Duration: 1973-

Age: 14-18
Ability: average, above avg.
Subject: chemistry, physics, math
Language: Dutch
Translations: none
Testing of Students: written achievement tests

Materials Developed by Project:

Print	Non-Print
Eval. Materials	none

Types of Learning Experiences:
Lecture

PRINCIPAL PROFESSIONAL STAFF:

Dr. P. K. H. Broekman, Physics
Dr. G. Bakker, Mathematics
Dr. J. Schouten, Chemistry

PROJECT HISTORY:

Principal Initiator(s): CITO

Reason(s) for Project Initiation: Teacher service

Evolution and Development of the Project: Tests are continuously revised and new tests are being developed. Tests are based on completion of units of instruction and cover a number of special subjects such as heat, electricity, energy, mechanics, etc. Development of evaluation tests is in cooperation with the Physics Curriculum Development Project for General Secondary Education (PLON), the Commission to Modernize Dutch Chemistry Curricula, and the Commission to Modernize Dutch Biology Curricula.

PROJECT OBJECTIVES:

Overall Project Purpose: Tests are being developed for the evaluation of learning activities. Tests are to be used at the end of an instruction period covering a special unit, e.g. electricity, heat and energy, light, mechanics, etc. Tests are to be completed by the students in a period of 50 minutes.

Specific Objectives: Tests cover fundamental topics presented during the physics, chemistry and mathematics curriculum for schools for mavo, havo and vwo (the three levels of General Secondary Education in the Netherlands). The fundamental topics are related to the goals on which the State Examinations are based. The final examinations of the different school types are centralized and supervised by the Dutch government.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: For students in mavo, havo and vwo schools, the three levels of General Secondary Education in the Netherlands (Ages 14-18).

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Physics Tests: Electricity Heat and Energy Mechanics General Topics in Physics	copy free/ set of 30- $8.00	CITO

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material	Cost	Source
Chemistry Tests: Final examinations for mavo and havo 1971-1976 Diagnostic tests for students of mavo schools	copy free/ set of 30- $8.00	CITO
Mathematics Tests: Functions and Relations Vectors in R_2 and R_3 Final examinations for mavo 1970-1976	"	"
Biology Tests: Final examinations for mavo, havo and vwo schools Multiple choice tests for genetics, transport phenomena and growth	"	"

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: See Materials Already Produced, Including Sources and Costs.

ADDITIONAL MATERIALS BEING DEVELOPED:

Physics Tests:
- Optics and Waves
- Electromagnetic Induction
- Sound
- Behavior of Gases
- Laboratory Activities

Chemistry Tests:
- Laboratory Activities
- Brönsted Theory

Mathematics Tests:
- Differential Equations
- Integral Calculus

Biology Tests
- Tests are being developed in cooperation with the Dutch Commission to Modernize Dutch Biology Curricula.

TEACHER PREPARATION:

Consultant Services: Teachers receive a test and item analysis as well as teacher directed guidelines which discuss a number of difficulties related to the specific items.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

In-House or Unpublished Research: Results of tests and examinations are published in internal memos.

Availability of Evaluative Data: For further information contact the project directors.

ACHIEVEMENT TESTS FOR PHYSICS, MATH
AND CHEMISTRY (3)

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Development of evaluation tests in participation with the Physics Curriculum Development Project for General Secondary Education (PLON) and with the Commission to Modernize Dutch Chemistry Curricula.

PLANS FOR THE FUTURE:

Extension of the number of subjects for which tests are available in order to increase the possibilities for service to teachers and students. Development of tests based on laboratory activities. Development of tests for evaluation purposes of the Physics Curriculum Development Project for General Secondary Education (PLON). Development of individually scheduled students tests which enable students to recover small gaps themselves.

PHYSICS CURRICULUM DEVELOPMENT PROJECT FOR GENERAL SECONDARY EDUCATION (PLON)

Lab. voor Vaste Stof
Sorbonnelaan 4
Utrecht, Holland
THE NETHERLANDS

Telephone: 030-532717/533107/532718/531175

Director: H. P. Hooymayers

Project Duration: 1972-1979

Additional information, see also Clearinghouse Reports: 9

Age: 12-17
Ability: average, above average
Subject: phys
Language: Dutch
Translations: none
Testing of Students: written achievement tests, teacher judgments, student attitude q're

Materials Developed by Project:

Print	Non-Print
Textbooks	Slides
Supplementary Books	Filmstrips
Activity Sheets	Lab Equipment
Tchr. Manuals	
Eval. Materials	
Charts	

Types of Learning Experiences:
Not answered

PRINCIPAL PROFESSIONAL STAFF:

Hans van Aalst, evaluation and policy
Wim van Bochoven, development and Audio Visual Media
Kees Groen, development and policy
Bruce Pelupessy, development and teacher training
Ronny Wierstra, research and evaluation
Wim Kamphuis, technician
Myriam Rolf von den Baumen, secretary
Pieter de Raad, evaluation assistant

PROJECT HISTORY:

Principal Initiator(s): G. H. Frederik

Reason(s) for Project Initiation: To develop curriculum materials in physics for the three levels of General Seconday Education (mavo, havo, and vwo) in the Netherlands.

PROJECT OBJECTIVES:

Overall Project Purpose: To modernize and update physics teaching in secondary school by means of a systematic development and evaluation of teaching materials.

Specific Objectives: The principles underlying PLON are as follows:
Physics lessons for 12-16 year olds should be of general education value.
School physics should deal not only with scientific concepts and models, but should also make a contribution to the understanding of technical applications.
Physics lessons must be interesting and meaningful to all pupils whether they are practically or theoretically inclined.
Lessons based on PLON material should enable pupils with varying interests and abilities to be taught together in one class and should give pupils opportunities to make their own decisions and to work at their own pace.
The lessons should encourage pupils to work with one another as well as with their teachers. PLON course material should provide plenty of opportunities for this.
Physics lessons should help the pupil to become aware of his own potential and his own limitations.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Physics students, aged 12-17, of average and above average ability.

UNIQUE CHARACTERISTICS OF THE PROJECT: (continued)

Ways in which it differs from similar or previous programs: It is intended that the pupil should learn thoroughly a number of basic concepts of physics which he will be able to apply to new situations. These concepts indicate what the pupils should have mastered and understood thoroughly by the end of the course. Examples of very simple concepts are:

Refraction is caused by the surface of water. The light seems to come from a different direction than the one from which it in fact comes.
Metals can be stretched or bent.
Some metals are better conductors of heat than others.

Furthermore, the PLON course pays special attention to the methods of research in physics and explains how to tackle problems in physics. The pupils are always expected to play an active role in lessons, work with one another, and are encouraged to discover their own abilities, interests and limitations.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
A large part of a course for the second grade, mavo, is now ready and has been tested (first version) in the school year '75/'76.	Not given	PLON

PRESENT COMMERCIAL AFFILIATIONS: Not answered

MATERIALS AVAILABLE FREE: Not answered

ADDITIONAL MATERIALS BEING DEVELOPED:

Second (revised) version for mavo/havo and vwo grade and first version third grade mavo.

TEACHER PREPARATION:

Consultant Services: Not determined

Pre-service and In-service Training: During the first tryout in '75/'76 we met the 7 trial teachers in our department, to discuss their experiences (once in 3 weeks). Also once in 3 weeks some trial teachers join in the project work. In the year '74/'75 we had a preparation course (once in 2 weeks).

PROJECT EVALUATED:

Yes X No _____ Internal _____ External Agency X

Name of Outside Evaluators: CITO (Central Institute for the Development of Achievement tests)

Pertinent Research Studies: Internal reports

In-House or Unpublished Research: Construction of an affective test for the first and last unit of the course. Formative evaluation by means of class observation, questionnaires, tests; and other instruments.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT:

Completing a course for second year of lower general education.
Evaluation of this course.
Meetings with trial teachers.

PLANS FOR THE FUTURE:

National Conference with teachers (public relations), December 1976. Continued curriculum development.

ACTIVE PHYSICS/CHEMISTRY PROJECT AND ACTIVE BIOLOGY

University of Trondheim
Norges Laererhøgskole
700 Trondheim
NORWAY

Telephone: not given

Director: Haakon Olsen

Project Duration: 1969-

Age: 13-16
Ability: not answered
Subject: chem, phys, biol.
Language: Norwegian
Translations: none
Testing of Students:
not answered

Materials Developed by Project:

Print	Non-Print
Student Units	Slides
Tchr. Guides	
Textbooks	
Lab Books	
Field Guides	

Types of Learning Experiences:
- Lab Activities
- Discussions
- Field Experiences

PRINCIPAL PROFESSIONAL STAFF:

Jacob Bøe, Bjørn Gylterud, Torstein Harbo, Asbjorn Solheim, Odd Schei
Writers: Fossli, Haave, Hønnås, Jensen, Vangberg

PROJECT HISTORY:

Reason(s) for Project Initiation: There was a need for a good science education program for grades 7-8 in Norway.

Evolution and Development of the Project: The project was started in 1969 as a cooperation between pedagogues and physicists. The development of the project was worked out in cooperation with many teachers in several schools. The response from the classes was then used as a base for revision of the contents of the course. Three consecutive revisions of this sort have been performed.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop an educational course for 7th through 9th grade to satisfy the demand of good scientific education, both from a pedagogical and scientific point of view.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Norwegian 7th, 8th, and 9th grade children.

Ways in which it differs from similar or previous programs:
1. The pupils will have the opportunity to learn physics, chemistry and biology through the specific properties of the subject itself.
2. The educational material will be presented in such a way that the pupils have to engage themselves in the learning process.
3. The courses will take the maturity of the pupils properly into account.
4. The actual situation of the teacher in the school system will be taken into account.
5. The economy situation of the various schools will be taken into account.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Aktiv Fysikk - Kjemi for Ungdomstrinnet (Active Physics - Chemistry for youth school) Grades 7 and 8 Student Units 1, 2, 3, 4, 5 Teacher Guide Books for Units 1, 2, 3, 4, 5 Grade 9 Students Units 6, 7, 8	Not Given	Not Given

PRESENT COMMERCIAL AFFILIATIONS:

Gyldendal Norsk Forlag, Oslo, Norway.

ACTIVE PHSYICS/CHEMISTRY PROJECT AND ACTIVE BIOLOGY (2)

MATERIALS AVAILABLE FREE: Not answered

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION: Not answered

PROJECT EVALUATED: Not answered

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

ENVIRONMENTAL EDUCATION IN PRIMARY SCHOOL

Institute for Educational Research
University of Oslo
Blindern, Oslo 3
NORWAY

Telephone: (02) 46 68 00, EXT. 8294

Directors: Bjarne Bjørndal and Sigmund Lieberg

Project Duration: 1969-1977

Age: 7-12
Ability: all
Subject: integrated science
Language: Norwegian
Translations: none
Testing of Students: teacher judgments

Materials Developed by Project:

Print	Non-Print
Textbooks	Slides
Activity Sheets	Audiotape
Tchr. Manuals	
Overview	
Teaching-Learning Units	

Types of Learning Experiences:

Discussion
Lab Activities
Field Experiences

PRINCIPAL PROFESSIONAL STAFF:

Bjarne Bjørndal and Sigmund Lieberg, Directors
Astrid Sandås, Project Secretary and Research Assistant

PROJECT HISTORY:

Principal Initiator(s): Bjarne Bjørndal

Reason(s) for Project Initiation: Study on curriculum development in primary science in the U.S.A.

PROJECT OBJECTIVES:

Overall Project Purpose: Insight into our bio-physical and socio-cultural environment.

Specific Objectives: 1) Understanding of environmental problems and the idiosyncratic implications of these problems; 2) Motivation to work actively for the solution of these problems.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Pupils in Grades 1-6 (ages 7-12) and teachers without any formal degrees in science.

Ways in which it differs from similar or previous programs:

1. Integrated science with focus on Environmental Education
2. Based on interrelations in teaching theory
3. Interdisciplinary approach

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Approximately 80 teaching-learning units organized in five different chains or themes. The chains are: The eco-system Sea and land resources Energy and use of resources Population development Pollution problems	Not Given	Project

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ENVIRONMENTAL EDUCATION IN PRIMARY SCHOOL (2)

ADDITIONAL MATERIALS BEING DEVELOPED:

Bjørndal, B. and S. Lieberg: An Introduction to ECO-education. A Study Book For Teachers. 120 pages, Aschehough, Oslo 1975.

TEACHER PREPARATION:

Consultant Services: Available through regional in-service training centers.

Pre-service and In-service Training: In-service training for trial teachers only.

PROJECT EVALUATED:

Yes X No _____ Internal X External Agency _____

In-House or Unpublished Research: Internal report series available in Norwegian.

PROJECT PUBLICITY:

Environmental Education in Primary School. A Presentation of a Norwegian Curriculum Development Project. *Scand. J. Educ. Res.*, 19, 131-151.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

DEVELOPMENT AND CORRESPONDING ANALYSIS OF THE CURRICULUM FOR CONTINUING SCHOOLS IN ZUG (EBAC-WS)

(ENTWICKLUNG UND BEGLEITENDE ANALYSEN DES CURRICULUMS WEITERBILDUNGSSCHULE ZUG)

Forschungszentrum
Rue de l'Hôpital la
CH-1700 Fribourg
SWITZERLAND

Telephone: 037 22 94 70

Directors: Bruno Santini, Anselm Rohner

Project Duration: 1970-1976

Additional information, see also
Clearinghouse Reports: 9

Age: 17,18
Ability: average
Subject: integrated sci., math, soc. sci., health
Language: German
Translations: none
Testing of Students: written achievement tests, oral tests, teacher judgments, student attitude q're, interest inventories

Materials Developed by Project:

Print	Non-Print
Behavorial Objectives Overview Newsletters	

Types of Learning Experiences:

Lecture
Discussion
Independent Study
Lab Activities
Field Experiences
Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Willi Schumacher, Coordinator of the school
Herbert Bürgisser, Representative of teaching staff
Fritz Michel, Representative of Directory of City Schools
Anselm Rohner, Representative of Research group
Bruno Santini, Member of Research group

PROJECT HISTORY:

Principal Initiator(s): Department of Education of Zug/Forschungszentrum-FAL

Reason(s) for Project Initiation: Requirement of a general preliminary instruction for social, and medical schools and school of arts and crafts.

Evolution and Development of the Project: After the opening of the school (spring 1972) and the publication of the Curriculum (Sept. 75) an evaluation will take place. FAL will probably be phased out at the end of 1976. Currently a new consultation system is being prepared.

PROJECT OBJECTIVES:

Overall Project Purpose: Planning, Development and Evaluation of a new school and a Curriculum.

Specific Objectives:

Development of processes regarding the inquiry of objectives
Development of processes regarding the formative evaluation
Corresponding analysis for inquiry of objectives, evaluation etc.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students of the canton Zug who do not aspire to university study but do plan to enter professions which require longer school training.

Ways in which it differs from similar or previous programs: Planning of a school with a great deal of support directly from teachers and scholars and indirectly from the people affected by the school, including population, government and investigators.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material

Teilcurriculum der Weiterbildungsschule Zug. Teil I - III Zug-Fribourg/CH 1975 (Erziehungsdirektion, Forschungszentrum-FAL at approximately $80.00). This curriculum includes objectives for the whole school as well as for individual subjects. It also consists of guides to the organization, supervision, planning and development of the school, and on the evaluation by criterion referenced tests.

PRESENT COMMERCIAL AFFILIATIONS: Not answered

MATERIALS AVAILABLE FREE: Not answered

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION:

Consultant Services: Information on demand.

Pre-service and In-service Training: Further education:
Seminars in further education (3 days/year)
Working groups to handle evaluation problems (total - 7 days/year)
Financing by Canton and City

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Pertinent Research Studies:

Niedermann Albin: Formative evaluation. Fribourg/CH 1975 (Pädagogisches Institut) Doctoral thesis

In-House or Unpublished Research: Working papers on attitude and expectations of scholars in the school.

Availability of Evaluative Data: Smaller working papers on demand.

PROJECT PUBLICITY:

Bossart Kurt: Verfahren zur Lernzielerhebung. Basel 1975 (Beltz)

Bossart Kurt: Persönlichkeitsmerkmale von Lernzielformulierern. Basel (Beltz)

Frey Karl, Santini Bruno, Brunner Joe, Niedermann Albin: Developmental Strategy and Evaluation of a New School. In a report about School based Curriculum Development of the OECD. 1976.

Frey Karl, Santini Bruno, Bossart Karl, Niedermann Albin: Ligitimation und Entwicklung einer neuen Schule. In Zeitschrift für Pädagogik. 1976.

Niedermann Albin: Formative Evaluation. Entwicklung und Erprobung eines Evaluationskonzepts für eine Modellschule. Fribourg/CH 1975 (Univeristy) - Doctoral thesis.

Niedermann Albin, Santini Bruno: Die Evaluation eines neuen Schultyps am Beispiel der Weiterbildungsschule Zug (Schweiz). In Frey K. et al. (Hrsg.): Curriculum-Handbuch. Band II. München 1975, 730-738 (Piper).

Santini Bruno: Qualifikationsermittlung mit Hilfe von Abnehmer-Experten-Gruppen: Lernziele für einen neuen Schultyp am Beispiel der Weiterbildungsschule Zug (Schweiz). In: Frey K. et al. (Hrsg.): Curriculum-Handbuch. Band II. München 1975, 215-219. (Piper).

PROJECT ACTIVITIES SINCE 1974 REPORT:

Beginning and continuing of the evaluation, publication of part of the curriculum 1975, new concept of further teacher training.

PLANS FOR THE FUTURE:

End of collaboration of FAL at the end of 1976 and development of a new consultation system. Publication of various journal articles.

ANALYSIS OF THE EVOLUTION OF A SCIENCE CONCEPT: MACROMOLECULES

Institut für die Pädagogik der Naturwissenschaften (IPN)
Olshausenstrasse 40/60
D-2300 Kiel, WEST GERMANY

Telephone: (0431) 880-3168 and 880-3100

Director: Mins Minssen

Project Duration: 1975-1978

Age: adult
Ability: not answered
Subject: biol, chem, phys, soc. sci., sci. history
Language: German
Translations: English
Testing of Students: teacher judgments

Materials Developed by Project:

Print	Non-Print
Overview	
In developmental stage	

Types of Learning Experiences:
- Discussion
- Independent Study
- Field Experiences
- Seminar

PRINCIPAL PROFESSIONAL STAFF: W. Bünder, M. Lang, M. Minssen, W. Walgenbach

PROJECT HISTORY:

Principal Initiator(s): W. Bünder, M. Minssen

Reason(s) for Project Initiation: Enlargement of pre-service and in-service teacher training; introduction of elements of science history into the construction of integrated science curricula.

Evolution and Development of the Project: The program has its origin within a teacher-training project. The procedure is originally based on the adaption of elements of the Nuffield Humanity Curriculum Project for Science. The program deals with historical and sociological influences and intrascience communication concerning the evolution of the macromolecule concept.

PROJECT OBJECTIVES:

Overall Project Purpose: Development of guide-lines for the construction of integrated science units.

Specific Objectives: Guided selection of materials in science history for the construction of curriculum units for teachers and education students. Historical reconstruction of science evolution in the field of Macromolecule Research for the purpose of science teaching. Inquiry into the connection between the theoretical framework of a specific science concept and trends in different areas of science, technology and society.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Student teachers. Pre-service and in-service training for teachers.

Ways in which it differs from similar or previous programs. Considerable amount of self-directed student activities in the field of philosophy and history of science.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

In developmental stage. No materials produced at this time.

PRESENT COMMERCIAL AFFILIATIONS: Not answered

MATERIALS AVAILABLE FREE: Not answered

ADDITIONAL MATERIALS BEING DEVELOPED:

A pool of materials dealing with scientific and technological events and implications in connection with the macromolecule concept.

ANALYSIS OF THE EVOLUTION OF A SCIENCE CONCEPT:
MACROMOLECULES (2)

TEACHER PREPARATION:

Consultant Services: Cooperation with pre-service training at the University of Hamburg and in-service training at the Institute for Practice and Theory of School Education (IPTS).

Pre-service and In-service Training: Teacher education at the University of Kiel.

PROJECT EVALUATED: Not answered

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE:

Publication of a project overview by the end of 1976.
Publication of the results obtained by cooperation with teachers and students within the program.

ECOLOGICAL AND ENVIRONMENTAL EDUCATION

Institut für die Pädagogik
der Naturwissenschaften (IPN)
Olshausenstr. 40/60, 2300 Kiel
WEST GERMANY

Telephone: (0431) 880-3135

Director: G. Eulefeld

Project Duration: 1973-1977

Additional information; see also
Clearinghouse Reports: 9

Age: 6-adult
Ability: all
Subject: bio, chem, phys, earth-space, soc. sci.
Language: German
Translations: none
Testing of Students:
- written achievement tests
- oral tests
- standardized tests
- teacher judgments
- student q're
- interest inventories

Materials Devloped by Project:

Print
- Programmed Units
- Activity Sheets
- Tchr. Manuals
- Eval. Materials (tests)
- Behavioral Objectives
- Overview of Project
- Annotated Bibliography

Non-Print
- Slides
- Filmstrips
- Filmloops
- Overhead Trans.
- Games
- Models
- Instructional Units

Types of Learning Experiences:
- Lecture
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Demonstrations
- Simulations
- Audio visual

PRINCIPAL PROFESSIONAL STAFF:

K. Frey, H. Haft, W. Isensee, J. Lehmann, B. Maaßen, B. Marquardt, K. Schilke, J. A. Bloch, D. Bolscho, W. Bürger, G. Eulefeld, K. H. Horn.

PROJECT HISTORY:

Principal Initiator(s): G. Eulefeld

Reason(s) for Project Initiation: Up to now, ecology has been a topic of biological instruction. In recent years, however, other aspects of ecology have been taken into consideration under the heading "Environmental Pollution". The necessary integration in school programs has not followed. Students have been left to integrate biological, chemical, social and economic knowledge by themselves.

PROJECT OBJECTIVES:

Overall Project Purpose: The general task of this curriculum project is the development of a detailed concept for teaching ecology. The position of Man in this project is to be considered from two points of view: on one hand he is part and object of the ecosystem, on the other he is its outside controller, who can influence the system intelligently.

Specific Objectives: Several products are planned, addressed to different groups: Analysis of literature and general reflections will be published for specialists in science education; an instructional conception for a problem oriented, interdisciplinary treatment of the field of ecological and environmental education; materials for teachers and students which can be used directly in schools.

One subgroup of the project has developed an instruction unit on the "Problems of Water Pollution". Scientific as well as social scientific methods are used in the analysis of water pollution in the community in which the school is located. The material has been developed as self-teaching material with different topics for four small groups of pupils. Biological indicators, oxygen analyses, the efforts of the community to keep the waters clean and the interests of the causers and of those affected by water pollution are analyzed partly within, and partly outside of, the school.

ECOLOGICAL AND ENVIRONMENTAL EDUCATION (2)

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Science education specialists, curriculum developers, teachers, students, grade 1-12.

Ways in which it differs from similar or previous programs:

- interdisciplinary conception (science and social science)
- instructional concept for a problem-oriented, interdisciplinary treatment of the field of ecological and environmental education.
- self-teaching materials with different topics for small groups of pupils.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
I. Boje Maaßen: Unterrichtsmaterialien zum Bereich Ökologie - Umweltschutz. Eine annotierte Bibliographie. A descriptive and evaluative review of materials concerned with ecological and environmental problems has been presented in the form of an annotated bibliography. Each item analyzed is described under categories, for example: school type, subject, presentation form, learning situations etc.	DM 10	IPN
II. Considerations about innovation problems in the project "ecological and environmental education".	Not given	IPN
III. Description of experiments for pupils concerning oxygen concentration of water.	Not given	IPN
IV. Considerations to structure school biology by means of ecological principles.	Not given	IPN

PRESENT COMMERCIAL AFFILIATIONS: IPN (Institut für die Pädagogik der Naturwissenschaften)

MATERIALS AVAILABLE FREE: Not listed

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION: Not answered

PROJECT EVALUATED:

Yes ____ No _X_ Internal ____ External Agency ____

PROJECT PUBLICITY:

I. Eulefeld, G./Frey, K./Haft, H./Isensee, W./Lehmann, J./Marquardt,B./Schilke,K. Kurzdarstellung des Projekts (Stand: 1.Februar 1975) "Ökologie im Unterricht allgemeinbildender Schulen", Institut für die Pägagogik der Naturwissenschaften, 2300 Kiel.

II. Eulefeld, G./Frey, K.: Innovationsstrategische Konzepierung von Curriculumprojekten mit Bezug auf vershiedene curriculare Instanzen und Informationsstrukturen, dargestellt am Projekt "Ökologie und Umwelterziehung". In: Hameyer, U./ Arreger, K./Frey, K. (Hrsg.): Bedingungen und Modelle der Curriculuminnovation. Weinheim: Beltz, 1976

III. Eulefeld, G.: Schülerexperimente zum Sauerstoffgehalt der Gewässer im Rahmen eines prozeßorientierten Curriculums. In: MÜLLER, P. (Hrsg.): Verhandlungen der Gesellschaft für Ökologie, Saarbrücken, 1975. Den Haag: Junk, 1974a, 307-314

IV. Eulefeld, G.: Ein Ökologisches Strukturierungsprinzip für das Biologie-Curriculum in der Sekundarstufe I. In: Kattmann, U./Isensee, W. (Hrsg.): Strukturen des Biologieunterrichts. Köln: Aulis, 1975.

ECOLOGICAL AND ENVIRONMENTAL EDUCATION (3)

PROJECT ACTIVITIES SINCE 1974 REPORT:

Developing an instructional conception of a problem-oriented, interdisciplinary treatment of the field of ecological and environmental education; discussion of this conception in a seminar "Ecology in Instruction" in the Institut für die Pägagogik der Naturwissenschaften.

PLANS FOR THE FUTURE:

-development of instructional units
-publication about the instructional conception 1976.
Eulefeld, G.: Frey, K./Haft, H./Isensee, W./Lehman, J./Marquardt, B./ Maaßen, B.
Schilke, K.: Ökologie/Umwelterziehung. Ein didaktisches Konzept.

INTEGRATED NATURAL SCIENCE CURRICULUM (PINC)

Curtiusstr. 13
1000 Berlin 45
WEST GERMANY

Telephone: 833 72 57

Director: Wilhelm Quitzow

Project Duration: 1970-1976

Additional information, see also
Clearinghouse Report: 9

Age: 13-16
Ability: all
Subject: integrated phys, chem, biol, tech.
Language: German
Translations: none
Testing of Students: written achievement tests, lab performance tests, teacher judgments

Materials Developed by Project:

Print	Non-Print
Supplementary Books	Slides
Activity Sheets	Overhead Trans.
Overview	Lab Equipment
Charts	

Types of Learning Experiences:
- Lab Activities
- Lectures
- Seminars
- Discussions
- Small Group Work

PRINCIPAL PROFESSIONAL STAFF:

Regina Goergen, Eckard Hermann, Wolfgang Jörg, Bernhard Mensch, Dieter Riedel, Willi Uebach (Research Assistants).

PROJECT HISTORY:

Principal Initiator(s): K. Urich, W. Quitzow

Evolution and Development of the Project:

Application January 1971
Acceptance June 1972
Work began November 1972
Funding: Bundesministerium fur Bildung und Wissenschaft, Bonn Senator für Wissenschaft und Kunst, Berlin.

PROJECT OBJECTIVES:

Overall Project Purpose:

Development of fundamental objectives and contents of science teaching.
Development of a concept for an integrated natural science curriculum with special emphasis on technical applications and social relevance of the natural sciences.
Development and testing of special teaching units.

Specific Objectives:

Investigation of possibilities of team teaching.
Analysis of learning difficulties, development of compensatory measures.
Development of validity controls.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: The project is especially conceived for comprehensive schools for students aged 13-16 in Berlin, where the pupil population consists of members of different social strata (in contrast to the traditional rigid three-tract school system).

Ways in which it differs from similar or previous programs: The difference between this project and others similar is the attempt to make the social relevance of the natural sciences the central idea of the curriculum without, however, neglecting the structural content of the sciences.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Concept for a natural science curriculum based on the central idea of the social relevance of the natural sciences (historic development, technical application, etc.)	Unknown at present	Beltz-Verlag
Natural science curriculum (rough content outline) for grades 7 to 10		
Integrated teaching unit "Studying your own body"		
Coordinated teaching units for Grade 7" a) The basic work process (physics) b) The production of iron (chemistry) c) How man developed from the ape (biology)		
Integrated teaching unit (phsics/chemistry) for grade 9: "Production of plastics"		
Teaching unit (biology)for grade 10: "Genetics"		

Information and limited materials for research use are available through the project director.

PRESENT COMMERCIAL AFFILIATIONS:

Beltz-Verlag, Am Hauptbahnhof 10, 6940 Weinheim, Germany

MATERIALS AVAILABLE FREE: Not answered

ADDITIONAL MATERIALS BEING DEVELOPED:

Final publication of curriculum as a book, expected 1977

TEACHER PREPARATION:

Consultant Services: Advice of former members of the curriculum project (PINC).

PROJECT EVALUATED:

Yes Partly No ____ Internal X External Agency ____

PROJECT PUBLICITY:

1. W. Quitzow: Ziele des naturwissenschaftlichen Unterrichts und Bedingungen ihrer Realisierung an Schule und Hochschule. In: H. Dahncke (Hrsg.): Zur Didaktik der Physik und Chemie, Schroedel, Hannover 1974.
2. W. Quitzow, D. Riedel: Gesellschaftliche Arbeit als Leitprinzip des naturwissenschaftlichen Unterrichts. In: H. Dahncke (Hrsg.): Zur Didaktik der Physik und Chemie, Schroedel, Hannover 1975.
3. W. Uebach, W. Jörg :Curriculare Beispiele für den Physikunterricht in der Sekundarstufe I auf der Basis des Leitprinzips "gesellschaftlicher Arbeit", see No. 2.
4. R. Pauly, P. Wurmbach: Curriculare Beispiele für den Biologie- und Chemieunterricht in der Sekundarstufe I auf der Basis des Leitprinzips "gesellschaftliche Arbeit", see No. 2.
5. G. Fieblinger, W. Quitzow: Gesellschaftliche Arbeit als Leitprinzip des naturwissenschaftlichen Unterrichts - allgemein Darstellung und Unterrichtsbeispiele, see No. 2.
6. W. Quitzow, D. Riedel: Inhaltliche Gestaltung des naturwissenschaftlichen Unterrichts nach dem Leitprinzip "gesellschaftliche Arbeit" - Grundlagen und Strukturprinzipien. In: H. Dahncke (Hrsg.): Zur Didaktik der Physik und Chemie, Schroedel, Hannover 1976.

PROJECT PUBLICITY: (continued)

7. W. Uebach: Rahmenplanung für den Gesamtunterricht in der Sekundarstufe I, see No. 6.
8. P. Wurmbach: Darstellung des Projektes "Kunststoffproduktion", see No. 6.
9. Projektgruppe "Integriertes Naturwissenschaftliches Curriculum" (PINC): Naturwissenschaftlicher Unterricht und Gesellschaftliche Arbeit, betrifft: erziehung 3/76, S. 30.
10. W. Quitzow, D. Riedel, W. Uebach, P. Wurmbach: Naturwissenschaftlicher Unterricht (Physik, Chemie, Biologie). In: U. Preuss-Lausitz, B. Schaeffer, W. Quitzow: Fachunterricht und politisches Lernen, Beltz, Weinheim 1976.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Project will be completed June 1976.

IPN - LEHRGANG "STOFFE UND STOFFUMBILDUNGEN" 8/13

Institut für die Pädagogik der Naturwissenschaften an der Universität Kiel
(IPN Institute for Science Education)
Olshausenstrasse 40-60,
D-2300 Kiel,
WEST GERMANY

Telephone: 0431/8803166

Director: Johann Weninger

Project Duration: 1968 -

Additional information, see also the 20-Year Cumulative Directory.

Age: 14-18
Ability: above average
Subject: chem, phys
Language: German
Translations: none
Testing of Students:
- classroom observation
- written achievement tests
- teacher judgments
- student attitude q're
- interest inventories

Materials Developed by Project

Print
- Textbooks
- Lab Books
- Activity Sheets
- Tchr. Manuals
- Eval. Materials

Non-Print
- Slides
- Overhead Trans.
- Models
- Lab Equipment

Types of Learning Experiences:
- Discussion
- Lab Activities
- Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Werner Dierks
Wolfgang Marcus
Helga Pfundt
Johann Weninger

PROJECT HISTORY:

Principal Initiator(s): Johann Weninger

Reason(s) for Project Initiation: Desire for innovation in chemistry teaching.

Evolution and Development of the Project: The project started with the development of teaching units in chemistry, the organization of try-out centers and related research activities in chemistry teaching. The planning aspect of the curriculum for classes 8-13 has been completed. The curriculum material for the 8th level will be commercially available in 1976. The material for the following school years will be published in annual intervals thereafter.

PROJECT OBJECTIVES:

Overall Project Purpose: The overall project purpose is innovation in chemistry teaching by developing a curriculum which enables the students to understand and master their chemical and technological environment by acquainting them with basic concepts and skills.

Specific Objectives: The instruction starts from the phenomena and leads step by step to the hypotheses which enable an interpretation of the observed phenomena. The phenomena are presented in such an order that the abilities acquired by the students serve as provisional basis for their understanding of subsequently presented phenomena. The instruction pays attention to the occurrence of wrong ideas and is careful in replacing those by correct ones. It is problem-oriented, thus evoking questions on part of the students and motivating them to active participation in subsequent lessons.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students ages 14-18 in all kinds of gymnasiums (high school).

IPN - LERHGANG "STOFFE UND STOFFUMBILDUNGEN" 8/13 (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Materials for Part I of the curriculum:	not given	IPN
Teachers Manual		
Teachers Lab Book		
Tests		
Students Textbook		
Students Lab Book		
Students Activity Sheets		
Slides		
Overhead Transparencies		
Models		
Lab Equipment		

PRESENT COMMERCIAL AFFILIATIONS:

Ernst Klett Verlag
Postfach 809
D-7000 Stuttgart
West Germany

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION:

Consultant Services: The curriculum is not yet published and therefore not yet available for teachers.

PROJECT EVALUATED:

Yes X No _____ Internal X External Agency _____

Pertinent Research Studies: Lang, M.: Zur Messung der von Schülern erfassten Bedeutung naturwissenschaftlicher Termini. IPN-Arbeitsbericht, Kiel, 1973.

In-House or Unpublished Research: Lucht, H.: Attitudes toward the IPN-Curriculum (chemistry) unpublished in-house polyskript, Kiel: IPN, 1972. During the development of the curriculum student attitudes towards chemistry and the innovational concept of the curriculum were measured (questionnaire and Semantic Differential) in order to evaluate the IPN-curriculum and to compare its effects with those of the regular curriculum.

Availability of Evaluative Data: Contact project director.

PROJECT PUBLICITY:

Marcus, W.: Eine Hinführung zu der Hypothese, dass zwischen chemischen und elektrischen Vorgängen enge Zusammenhänge bestehen. MNU 28 (1975), S. 350.

Marcus, W., Pfundt, H.: Die Entwicklung und Erhärtung der Hypothese vom diskontinuierlichen Aufbau der Stoffe. MNU 28 (1975), S. 472.

Pfundt, H.: Ursprüngliche Erklärungen der Schüler für chemische Vorgänge. MNU 28 (1975), S. 157.

Pfundt, H.: Stoffe und Stoffumbildungen - Zum IPN-Lerhgang. MNU, im Druck.

Weninger, J., Dierks, W.: Zum IPN-Lehrgang "Stoffe und Stoffumbildungen". In: Chem. Ztg., 1974, 98, 407-411.

Weninger, J., Dierks, W., Marcus, W.: Der Übergang von der Atomhypothese zur Kern-Elektron-Hypothese. MNU 27 (1974), S. 426.

IPN - LERHGANG "STOFFE UND STOFFUMBILDUNGEN" 8/13 (3)

PROJECT ACTIVITIES SINCE 1974 REPORT:

Completion of part I of the curriculum; revision of part II and continued development of part III.

PLANS FOR THE FUTURE:

Publishing of material for all parts of the curriculum.

PROGRAM NATURWISSENSCHAFTEN (SCIENCE PROGRAM)

Institut für die Pädagogik der
Naturwissenschaften (IPN Institute
for Science Education)
D-2300 Kiel 1,
Olshausenstrasse 40/60
WEST GERMANY

Telephone: (0431) 880-3494

Director: June Ann Bloch

Project Duration: 1974-

Additional information, see also
Clearinghouse Report: 9

Age: 4-7
Ability: all
Subject: general sci.
Language: German
Translations: none
Testing of Students: written achievement tests, oral tests, teacher judgments

Materials Developed by Project:

Print	Non-Print
Activity Sheets	Filmstrips
Tchr. Manuals	Audiotape
Eval. Materials	Games
Behavioral Objectives	Lab Equipment
Overview	

Types of Learning Experiences:

- Discussion
- Independent Study
- Lab Activities
- Demonstrations
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

June Ann Bloch

PROJECT HISTORY:

Principal Initiator(s): J. A. Bloch, G. Kochansky

Reason(s) for Project Initiation: Inclusion of science in elementary school curricula.

Evolution and Development of the Project: The program is an adaptation and translation of Individualized Science, an individualized K-7 curriculum developed at the Learning Research and Development Center, Pittsburgh, Pa. The German version was first under trial in Kindergartens in the Cologne area. It is now under trial in first and second grade in schools in the Flensburg area. The A level of the program is complete. Adaptation of the B and C levels of the program is in progress.

PROJECT OBJECTIVES:

Overall Project Purpose: To determine:

If such an individualized program using a multimedia approach is realistic in the German setting.
If teachers and students in an elementary school setting can operate with science within the German curriculum.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All levels of students ages 4-7 in German elementary schools.

Ways in which it differs from similar or previous programs: The notion of science instruction and an individualized program involving small group work are both new and untried in the German setting.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
1. Student booklets and worksheets which accompany audio tapes and manipulative materials	Not Given	English Version available from Imperial International Learning Corp.
2. Filmstrips		
3. Games		
4. Teachers manual including behavioral objectives, ideas for small group work, material lists, descriptions of each individualized lesson, test keys, etc.		
5. Student answer books.		

PROGRAM NATURWISSENSCHAFTEN (SCIENCE PROGRAM) (2)

PRESENT COMMERCIAL AFFILIATIONS:

Imperial International Learning Corporation
Box 548
Kankakee, Illinois 60901 USA

MATERIALS AVAILABLE FREE: Newsletter concerning English version from publisher.

ADDITIONAL MATERIALS BEING DEVELOPED:

Further games and small group work ideas more suited for the German setting.

TEACHER PREPARATION:

Consultant Services: In-service consultation and regular school visits by program coordinator.

Pre-service and In-service Training: A complete pre-service workshop was held. In-service consultation is financed by institute of program coordinator.

Pre-service and In-service Teaching Materials: Pre-service training involves use of actual student materials and additionally prepared information sheets for the teachers as well as the teachers manuals. Printed materials are reproduced institutionally.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Availability of Evaluative Data: From project coordinator.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT:

Work in progress on adaptation and translation of further levels of the program.

PLANS FOR THE FUTURE:

Preparation and testing of materials for the 4 years of German elementary school in conjunction with the teacher group in the Flensburg area.

SCIENCE EDUCATION FOR GRADE 11-13 WITH BOTH VOCATIONAL AND ACADEMIC EMPHASIS

Institut für die Pädagogik
der Naturwissenschaften
Olshausenstrasse 40/60
D-2300 Kiel, WEST GERMANY

Telephone: 0431/880 3157 / 880 3100

Director: K. Frey

Project Duration: 1975-

Age: 15-18
Ability: all
Subject: biol, chem, phys, eng/tech, soc. sci.
Language: German
Translation: none
Testing of Students:
written achievement tests, oral tests, classroom observation, lab performance tests, teacher judgments

Materials Developed by Project:

Print	Non-Print
In developmental stage	

Types of Learning Experiences:
- Lecture
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Simulations

PRINCIPAL PROFESSIONAL STAFF:

W. Dierks
K. Frey
G. Heidegger
P. Häussler
M. Minssen
G. Schaefer

PROJECT HISTORY:

Principal Initiator(s): K. Frey

Reason(s) for Project Initiation: Consultant activities in an experimental school program (kollegschulversuch) for the combination of education for vocational and professional careers by the state of Nordrhein-Westfalen, West Germany.

Evolution and Development of the Project: The project originated from cooperation of IPN-Staff with teachers and other groups within the framework of the school program.

PROJECT OBJECTIVES:

Overall Project Purpose: Development of guidelines and model units for curricula for school systems which combine vocational schools and academically oriented secondary schools.

Specific Objectives: Facilitation of transition between science oriented vocational and academic careers by providing an adequate integrated science education. Design of models of polyfunctional courses for a variety of vocational and academic requirements. Training of teachers to enable them to develop curricula from existing guidelines and models according to specific local needs.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: The project deals with science education for pupils aged 15-18 from all socio-economic and socio-cultural strata of society including part time education for young workers who do unskilled labor.

Ways in which it differs from similar or previous programs: The school program to which this project is related is the first large scale program of this kind in the Federal Republic of Germany.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Program is in developmental stage. No materials produced at present.

SCIENCE EDUCATION FOR GRADE 11-13 WITH BOTH
VOCATIONAL AND ACADEMIC EMPHASIS (2)

PRESENT COMMERCIAL AFFILIATIONS: Not applicable

MATERIALS AVAILABLE FREE: Not applicable

ADDITIONAL MATERIALS BEING DEVELOPED:

In-house polycopies: Teacher manuals as guidelines for curriculum development within the specific school program including presentations of topics, contents and methods for model units; Proposals for working procedures to establish and realize common aims in curriculum development; Reports on the outcomes of the mutual cooperation of the groups involved in the specific school program.

TEACHER PREPARATION:

Consultant Services: Joint working sessions.

Pre-service and In-service Training: Workshops for in-service teacher training.

PROJECT EVALUATED: Not answered

Yes _____ No _____ Internal _____ External _____

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE:

Presentations on the project at the annual meetings of the GDCH (society of German chemists) and GDCP (society for education in chemistry and physics), both in September, 1976. Publication of project materials.

UNIT BANK BIOLOGY

Institut für die Pädagogik
der Naturwissenschaften (IPN)
D-2300 Kiel
Olshausenstrasse 40/60
WEST GERMANY

Telephone: (0431) 880-3133

Director: G. Schaefer

Project Duration: 1968 -

Additional information, see also
Clearinghouse Reports: 9, 8

Age: 10-18
Ability: average
Subject: biol, soc. sci., math, cybernetics
Language: German
Translations: none
Testing of Students:
- written achievement tests
- teacher judgments
- student attitude q're
- interest inventories

Materials Developed by Project:

Print
- Lab Books
- Activity Sheets
- Tchr. Manuals
- Eval. Materials
- Overview
- Parent Information Book

Non-Print
- Slides
- Filmstrips
- Overhead Trans.
- Models
- Lab Equipment

Types of Learning Experiences:
- Discussion
- Lab Activities
- Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

H. Bayrhuber, G. Eulefeld, K. Dylla, U. Kattmann, B. Marquardt, W. Isensee, R. Rimmele, G. Schaefer, K. Schilke

PROJECT HISTORY:

Principal Initiator(s): D. Dylla, G. Eulefeld, U. Kattmann, G. Schaefer and K. Hecht.

Reason(s) for Project Initiation: To correct the deficits in German general biology teaching.

Evolution and Development of the Project: The project started with pilot studies in 1968 (in Fulda) and has now grown to a systematic development of teaching units for grades 4-12 (in Kiel). The first eight units are commercially available.

PROJECT OBJECTIVES:

Overall Project Purpose: The curriculum is developed as a contrast to conventional biology teaching and seeks to motivate students by their own increased activity and the integration of sciences within biology.

Specific Objectives: The specific objectives of each lesson are stated in behavioral terms, and the attainment is assessed by corresponding test items.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Grades 4-12; ages 10-18; all abilities; all pupils and students of primary schools and Sekundarstufe I + II.

Ways in which it differs from similar or previous programs: The most innovative feature of the project is its attention to the social impact of biology. Among others, the following main topics are treated: Behavior, evolution, environmental studies, human genetics, cybernetics. These topics are the underlying pattern for the development of a "unit bank"; that is, a system of teaching units that can be used in a flexible way to build up curricula in grades 4 to 12 suitable to many kinds of school systems and teachers' tastes. In addition the same topics are maintained into the higher grades to form a spiral curriculum. By this system the learning process on important biological subjects can be intensified and the genesis of concepts investigated.

UNIT BANK BIOLOGY (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Units:	not given	IPN and Publisher

Man and beasts
Motion of the human body
Sexuality of Man
Food and Digestion
Ecological Equilibrium
Breathing and Blood Circulation
Hibernation
Leaves and Transpiration
Autumn and the falling of leaves
Locomotion in nature and technology

PRESENT COMMERCIAL AFFILIATIONS:

Aulis Verlag
Deubner and Co. KG.,
Antwerpener Strasse 6-12
D 5000 Köln, West Germany

MATERIALS AVAILABLE FREE: Contact Project Director.

ADDITIONAL MATERIALS BEING DEVELOPED: Additional Units.

TEACHER PREPARATION:

Consultant Services: Consultant services available for teachers using the materials. Training courses for teachers with accompanying instructions.

Pre-service and In-service Training: Activities conducted for pre-service and in-service teacher training are financed by the Institute (IPN) and by the teachers.

Pre-service and In-service Teaching Materials: Introductions as part of the teaching units are used for teacher training.

PROJECT EVALUATED:

Yes X   No _____   Internal X   External Agency _____

Pertinent Research Studies: In preparation.

In-House or Unpublished Research:

Bayrhuber, H., "Entwicklung und Erprobung von Schulversuchen zur biologischen Kybernetik."
Eulefeld, G., "Quantitative Untersuchungen an überschaubaren Ökosystemen."
Kattmann, U., and S. Stange, "Einstellungsmessungen mit Hilfe des Polaritätsprofils zum Rassenproblem."
Schaefer, G., "Die Leistungsfähigkeit kybernetischer Modelle für die biologische Begriffsbildung."

Availability of Evaluative Data: In preparacion.

PROJECT PUBLICITY:

Schaefer, G., Probleme der Curriculum-Konstruktion. Der Biolgieunterricht, 7 (1971), Heft 4, S. 6-17.
Kattmann, U., Entwicklung von Biologie-Curricula im IPN Kiel. MNU 24, S. 114-117, 1971.

UNIT BANK BIOLOGY (3)

PROJECT ACTIVITIES SINCE 1974 REPORT:

Development and printing of units.

PLANS FOR THE FUTURE:

Conferences to be held on the basic structures of biology teaching including cybernetics, ecology and environmental education, human biology and human behavior.

INTEGRATED SCIENCE

Centro de Treinamento para Professores
de Ciencias Exatas
e Naturais de São Paulo - CECISP
Caixa Postal 11.324
Sao Paulo SP
BRAZIL

Director: Myriam Krasilchik

Project Duration: 1972-

Additional information, see also
Clearinghouse Reports: 9

Age: 15, 16
Ability: all
Subject: integrated science
Language: Portuguese
Translations: none
Testing of Students:
- written achievement tests
- student q're
- interest inventories

Materials Developed by Project:

Print	Non-Print
Textbooks	Games
Tchr. Manuals	Lab Equipment

Types of Learning Experiences:
- Lecture
- Seminar
- Independent Study
- Lab Activities
- Field Experiences
- Simulations

PRINCIPAL PROFESSIONAL STAFF:

Angélica Ambrogi
Norma Maria Cleffi

PROJECT HISTORY:

Principal Initiator(s): Myriam Krasilchik

Reason(s) for Project Initiation: To develop an Integrated Science Course to meet the needs of students that will attend only one science course during high school.

Evolution and Development of the Project:

Development, 1973-1974
Evaluation of experimental edition - 1975
Revision and preparation for commercial publication - 1976

PROJECT OBJECTIVES:

Overall Project Purpose:

1. Learn basic concepts of science and their implications in the modern world.
2. Analyze interaction between man and the environment.
3. Develop attitudes and problem solving abilities.

Specific Objectives:

Each aim was subdivided into more specific educational objectives and each chapter of the teacher's guide presents

a. main ideas
b. objectives

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students aged 15 and 16, not interested in science careers.

Ways in which it differs from similar or previous programs: There are no similar Brazilian projects.

INTEGRATED SCIENCE (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Student's textbook	Not Given	Integrated Sci.
Teacher's manual	"	"
Laboratory equipment	"	"
Games and simulations	"	"
Tests	"	"

PRESENT COMMERCIAL AFFILIATIONS: The materials will be available commercially in 1977. The publisher was not selected yet.

MATERIALS AVAILABLE FREE: Not answered

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION:

Pre-service and In-service Training: Summer courses, workshops, for in-service teacher training. The materials are being used in Colleges of Education for pre-service.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Pertinent Research Studies: The evaluation report will be finished in April 1976.

Availability of Evaluative Data: Yes, by writing to CECISP - Caixa Postal 11.324 São Paulo, SP

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

SCIENCES, MATHEMATICS AND SOCIAL STUDIES FIRST GRADE (CESM)

FUNBEC
Caixa Postal 2089
Cidade Universitária
São Paulo SP
BRAZIL

Telephone: 211.22.48

Director: Antonio de Souza Teixeira, Jr.

Project Duration: 1975-1978

Age: 7-15
Ability: Average
Subject: biol, chem, phys, math, soc. sci.
Language: Portuguese
Translations: None
Testing of Students: written achievement tests, lab. performance tests, teacher judgments, student attitude q're interest inventories

Materials Developed by Project:

Print
- Textbooks
- Activity Sheets
- Tchr. Manuals
- Behavioral Objectives

Non-Print
- Games
- Models
- Lab Equipment
- Plants
- Maps and Pictures

Types of Learning Experiences:
- Lecture
- Seminar
- Discussion
- Lab Activities
- Field Experiences
- Simulations

PRINCIPAL PROFESSIONAL STAFF:

Silvia M. Manfredi - Evaluation Team and Project Coordinator
Eliana Ermel De Araujo - Biology team
Helena Mirabelli - Social Studies team
Lisbete Giacomini - Mathematics team
Lucia Pereira Pinzeta - Evaluation team
Mariantonia Chippari - Evaluation team
Maria Cristina Souza De A. Maranhão - Mathematics team
Maria José P.M. De Almeida - Physics team
Mariley S. Gouveia - Biology team
Nadya Gonçalves Rosa Lotti - Biology team
Raimundo Henrique Barbosa - Social Studies team
Regina Marta Barbosa Faria - Evaluation team
Solange M. De Souza Teixeira Malamud - Mathematics team

PROJECT HISTORY:

Principal Initiator(s): FUNBEC staff

Reason(s) for Project Initiation: FUNBEC initiated the project in order to provide new curriculum materials to satisfy the requirements of the national educational reforms begun two years ago.

Evolution and Development of the Project:

1. Held seminars to discuss Piaget's theories.
2. Translated and standardized the major tests for concrete and formal states.
3. Established the project goals.
4. Established the major content areas for 1st through 8th grade curricula.
5. Wrote a grant proposal outlining the project.

PROJECT OBJECTIVES:

Overall Project Purpose: To enable students to understand the various interacting components of natural environment and cultural environment in which they live; to understand man's role in altering these interactions; and to appreciate the necessity to establish criteria for man's role depending on social and/or individual values.

PROJECT OBJECTIVES: (continued)

Specific Objectives: Project staff is in the process of outlining specific objectives.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Brazilian students, ages 7 to 15.

Ways in which it differs from similar or previous programs: This project will develop curriculum materials based on the psychological and educational development of students.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material
No materials are available at present. Project is in developmental stage.

PRESENT COMMERCIAL AFFILIATIONS: Not applicable

MATERIALS AVAILABLE FREE: Not applicable

ADDITIONAL MATERIALS BEING DEVELOPED: Not applicable

TEACHER PREPARATION: Not answered

PROJECT EVALUATED: Not answered

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE:

The first edition of the curriculum materials will be published, tested, evaluated, and revised.

TECHNICAL TEACHING OF ELECTRONICS (PEPE)

FUNBEC
Caixa Postal 2089
CEP: 01000
Cidade Universitária
USP Sao Paulo SP
BRAZIL

Telephone: 211 22 48

Director: Antonio De Souza Teixeira, Jr.

Project Duration: 1975-

Age: 15-18
Ability: average
Subject: ed tech, eng/tech, phys
Language: Portuguese
Translations: none
Testing of Students: written achievement and lab performance tests, teacher judgments

Materials Developed by Project:

Print	Non-Print
Textbooks	Lab Equipment
Lab Books	
Tchr. Manuals	
Eval. Materials	
Behavioral Objectives	

Types of Learning Experiences:
Lecture
Discussion
Lab Activities
Demonstrations
Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

Prof. Antonio De Souza Teixeira, Jr., Director
Décio Pacheco, Author of text and lab equipment
Maria José P.M. De Almeida, Author of text and lab equipment
Nery Gejuiba Leite, Author of text and lab equipment
Sérgio Maniakas, Coordinator of text and lab equipment
Verenice Leite Ribeiro, Author of text and lab equipment

PROJECT HISTORY:

Principal Initiator(s): FUNBEC staff

Reason(s) for Project Initiation: FUNBEC initiated the project in order to provide new curriculum materials to satisfy the requirements of the national educational reforms begun four years ago.

Evolution and Development of the Project: At present the staff is developing texts and lab equipment.

1. Research on industrial needs of technicians
2. Characterization of electric and electronic technician competencies
3. Bibliographic research on programs related to technical teaching
4. Determination of the main goals of the project
5. Curriculum planning
6. Bibliographic research on contents of project
7. Revision of texts and laboratory equipment

PROJECT OBJECTIVES:

Overall Project Purpose: This project will develop curriculum materials to enable the student to work with electricity and electronics on a technical level.

Specific Objectives: At the end of the project the student will be able to:

1. Understand the main concepts in electricity and electronics;
2. Understand and apply the general principles of electricity and electronics;
3. Know basic electronic circuits and their functions;
4. Analyze theoretical and practical electronics circuits;
5. Synthesize complex circuits from electronics components and basic circuits;
6. Interpret electric and electronic circuit schemes, translating graphic representations to real components;
7. Do observations and measurements in electric and electronic circuits or in their components;
8. Do mental calculations involving applications of electricity and electronics;
9. Generate coordinated movements to do mechanical activities (manual ability);

PROJECT OBJECTIVES: (Continued)

Specific Objectives: (continued)

The project also intends to give the pupils an environment such that they will:

1. manifest interest in mechanical activities and electric and electronic problems; and
2. obey rules and laws in workshop security.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Brazilian students, ages 15 to 18.

Ways in which it differs from similar or previous programs: There are no similar projects.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Project is in developmental stage and no materials have been produced at this time.

PRESENT COMMERCIAL AFFILIATIONS: Not applicable

MATERIALS AVAILABLE FREE: Not applicable

ADDITIONAL MATERIALS BEING DEVELOPED: Not applicable

TEACHER PREPARATION: Not answered

PROJECT EVALUATED: Not answered

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE:

The curriculum material will be published and tested.

PROYECTO DE PERFECCIONAMIENTO EN SERVICIO, CIENCIAS NATURALES (PPS-CN)

Centro de Perfeccionamiento
Experimentación e Investigaciones
Pedagógicas
PPS-CN - Casilla 16162 Correo 9
Providencia
Santiago, CHILE

Telephone: 489-698

Director: Alexis Labarca

Project Duration: 1969-1976

Additional information, see also Clearinghouse Reports: 9,8,7

Age: teacher ed
Ability: all
Subject: biol, chem, phys, earth-space
Language: Spanish
Translations: none
Testing of Students: written achievement, lab performance and oral tests; teacher judgments

Materials Developed by Project:

Print	Non-Print
Tchr. Manuals	Slides
Eval. Materials	Videotape
Behavioral Objectives	Lab Equipment
Overview	Audiotape
Newsletters	
Self Instructional Module	

Types of Learning Experiences:

- Lecture
- Seminar
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Alexis Labarca, Director
Collaborators: Eloy Agloni, Cecilia Correa, Enrique Sirera, and Bartolomé Yankovic

PROJECT HISTORY:

Principal Initiator(s): Jorge Arancibia, Alexis Labarca, Héctor Muñoz, Irene Villarroel, Bartolumé Yankovic

Reason(s) for Project Initiation: The need to train Basic School teachers to be able to teach Natural Sciences using active methods.

Evolution and Development of the Project: This project has been carried out in three stages of gradual increase: First Stage - Testing and development of a new program based on Science a Process Approach(AAAS). 1967-1969, applied to a group of 20 teachers and 800 students. Second Stage - Regional trial of long-distance training, 1970-1973. This stage consists of the production and testing of self-instructional material. Third Stage - National trial of long-distance training, 1974-1976. This stage was intended to try to meet the training demands of the whole country in this subject. The self-instructional materials already tested are being used. 100 supervisors have been trained as well in order to help the feedback.

PROJECT OBJECTIVES:

Overall Project Purpose: To enable the teacher in the Basic School to develop the Natural Sciences program.

Specific Objectives: 1) To instruct Basic School teachers in the methodological techniques of science as well as in basic scientific concepts and facts; 2) To develop self-instructional materials that may guide and improve the teaching-learning process in Science; and 3) To evaluate the application of the program and carry out trials of new curricula.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: It aims at every in-service teacher working at the grade 5-8 (age 10-13) level.

Ways in which it differs from similar or previous programs: The main difference lies in the fact that it is long-distance training and therefore teachers do not need to leave their working places. It is a massive project. The materials are intended to improve classroom work.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

The Self-Instructional Textbooks listed below are available from the PPS-CN and are free for foreign countries, except for postal charge. The textbooks are sold to teachers throughout the country at approximately $1.00 per copy.

"Observar": Proceso científico (125 pages)
"Medir": Proceso científico (131 pages)
"Comunicar": Proceso científico (112 pages)
"Clasificar": Proceso científico (118 pages)

The Experimental Editions listed below are available from the PPS-CN. Costs of these editions were not given.

"Controlar variables": Proceso científico (43 pages)
"Formular Hipótesis": Proceso cientifico (35 pages)
"Usar relaciones espaciales y temporales" (91 pages)
"Formular modelos" (in print)
"Qué es el Proyecto de Perfeccionamiento de Ciencias Naturales" (12 pages)
Informe sobre investigación en ejecución: "Proyecto de Perfeccionamiento de Ciencias Naturales"

PRESENT COMMERCIAL AFFILIATIONS:

Centro de Perfeccionamiento Experimentación e Investigaciones Pedagógicas

MATERIALS AVAILABLE FREE:

See Self-Instructional Textbooks listed under Materials Already Produced above.

ADDITIONAL MATERIALS BEING DEVELOPED:

Guides for teachers and tests for students.

TEACHER PREPARATION:

Consultant Services: There are two levels of consultant services: 1) 100 supervisors spread throughout the country with special training to assist and guide teachers directly; and 2) Central staff that consults with the supervisors and occasionally with other teachers.

Pre-service and In-service Training: Out institution only works with in-service teacher training. It is financed by the Government through the Ministry of Education. Occasionally seminars, workshops and conferences for teachers are carried out.

Pre-service and In-service Teaching Materials: For commercial editions the approximate cost is US $1.00 per copy. This price covers only the cost of publication, it does not include any profit.

PROJECT EVALUATED:

Yes X No ___ Internal ___ External Agency X

Name of Outside Evaluators: Private evaluators were hired in order to evaluate the project and some of the materials. The private evaluators were Guillermo Briones and Associates.

Pertinent Research Studies: "Evaluación de un programa de perfeccionamiento: El programa de perfeccionamiento en servicio PPS - Ciencias Naturales" G. Briones, E. Agloni, O. Villegas.

In-House or Unpublished Research: The final evaluation of the project is now being carried out. The evaluation project was presented to the Fourth Research Meeting in Education.

PROJECT PUBLICITY:

"Ensayo del Programa de Ciencias Naturales del 5º año de Educación General Básica". A. Labarca C. y J. Arancibia J. Revista de Educación No. 11. Octubre 1968, pgs 36-38 Santiago, Chile.

"Aprendiendo a observar con el nuevo programa de Ciencias Naturales". A. Labarca C., J. Arancibia J., H. Munoz y B. Yankovic. Revista de Educación No. 18. Julio 1969, pgs 23-28.

"Science Education in other Countries. Chile" Arancibia, Labarca, Munoz y Yankovic. Science Education News. Washington Ed. AAAS Sept. 1970.

"Chilean PPS: An Inservice Teachers Training Program". Bartolomé Yankovic N. The Science Teacher. April 1975 Washington D.C. pages 28-29.

PROJECT ACTIVITIES SINCE 1974 REPORT:

From March 1974 until December 1976 the project has been in its third stage -- teacher training on a national scale. Supervisors have been trained in order to direct more than 100 committees around the country. Presently there are 5000 teachers participating in these committees.

PLANS FOR THE FUTURE:

We intend to publish the results of the final evaluation of the project by December 1976, as well as recommend to the educational authorities the best procedures to continue this activity. Additional materials will continue to be published and further training courses for Natural Science supervisors will be designed.

ENVIRONMENTAL STUDIES PROGRAM (ESP)

Box 84
Cruz Bay
VIRGIN ISLANDS 00830

Telephone: (809) 774-6423

Director: Doris Jadan

Project Duration: 1970 -

Age: 8-13, adult
Ability: all, slow learner
Subjects: biol., soc. sci., language arts
Language: English
Translations: Spanish
Testing of Students:
- written achievement and oral tests
- teacher judgments
- student attitude q're
- interest inventories

Materials Developed by Project:

Print
- Textbooks
- Supplementary books
- Activity Sheets
- Tchr. Manuals
- Eval. Materials
- Overview

Non-Print
- Slides
- Films

Types of Learning Experiences:
- Discussion
- Independent Study
- Field Experiences
- Demonstrations
- Simulations

PRINCIPAL PROFESSIONAL STAFF:

Miss Judith Chinnery, Administrative Secretary
Mrs. Doris Jadan, Program Coordinator, St. Thomas-St. John

PROJECT HISTORY:

Principal Initiator(s): Mrs. Doris Jadan in cooperation with Virgin Islands National Park.

Reason(s) for Project Initiation: Need for local materials for young children to increase awareness and appreciation of the interaction of unique human and natural resources in a multicultural island ecosystem under severe pressures of rapid growth and change.

Evolution and Development of the Project:

The Environmental Studies Program of the V.I. Department of Education, now in its sixth year, is the first and only on-going program of environmental education for elementary pupils anywhere in the Caribbean community.

Since 1970, some 7,500 young Virgin Islanders in grades 4-5-6 and special education classes have participated in the E.S.P.

The program is presently funded by a Legislative grant of $19,000.

PROJECT OBJECTIVES:

Overall Project Purpose: Development of local, relevant West Indian Curriculum materials for elementary pupils of the Virgin Islands and environmental encounters in classrooms without walls in Virgin Islands National Park.

Specific Objectives: Overall objectives of the E.S.P. are wider awareness and deeper appreciation by young Virgin Islanders of their environment, natural and cultural, past, present, and future. Problems of rapid change and problem-solving options are studied, first-hand and first-foot.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Elementary school pupils in the Virgin Islands

Ways in which it differs from similar or previous programs: The Environmental Studies Program is interdisciplinary and issue-oriented. It is not limited to nature study and pollution abatement. A variety of lively, timely, local materials have been developed for pupils, teachers, and parents participating in the program.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Sources
A Guide to the Natural History of St. John - 72 page illustrated hardcover and paperback for pupils grades 6-8, teachers and parents	$2.95 paperback $5.50 hardcover	ESP, Inc.
The Adventures of Ivan Environman - 112 pages, 16 stories, Virgin Islands and West Indian focus. Supplementary reader	$1.95	ESP, Inc.
The Holiday Adventures of Ivan Environman	$2.50	ESP, Inc.
Fact Sheets and lesson plans for grades 4-5-6 and special education	Free	ESP[1] Project
Illustrated Ivan Environman Calendars of Virgin Islands natural cultural history - 1976 bicentennial calendar	$2.50	ESP, Inc.

PRESENT COMMERCIAL AFFILIATIONS:

E.S.P., Inc. - a Virgin Islands tax-exempt educational organization
Box 84
Cruz Bay
Virgin Islands 00830

Date of latest edition: 1975

MATERIALS AVAILABLE FREE:

[1] Environmental Studies Program
Virgin Islands Department of Education
Box 630
St. Thomas, Virgin Islands 00801

ADDITIONAL MATERIALS BEING DEVELOPED:

Teacher's manual for Ivan readers
Bilingual edition of Ivan stories (English-Spanish)
New Ivan reader for use in Sunday Schools
Ivan comic book

TEACHER PREPARATION:

Consultant Services: Three workshops conducted each year, twelve day in-service training program conducted with Virgin Islands National Park.

Pre-service and In-service Training: Environmental Education workshops, one-day demonstrations and introduction of E.S.P. materials, one day on site at study area in Virgin Islands National Park.

Teachers volunteer for the Environmental Studies Program with approval by their principals. Ten to 12 classes from public, private, and parochial schools will take part in each phase of the program, beginning with 6th grades in October, 5th grades in January, and 4th grades in April.

Teachers this year are required to set up and develop an Environmental Study Area within walking distance of their schools and submit lesson plans using this area to their principal and the E.S.P. office. Guidelines for setting up such study areas are given during the seminar. One of three demonstration environmental study areas in the V.I. National Park is visited, including Reef Bay for grade 6, Annaberg for grade 5, and Salt Pond-Drunk Bay for grade 4.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency X

Name of Outside Evaluators: Virgin Islands National Park

ESP (3)

PROJECT PUBLICITY:

American Education - June 1972
American Way - April 1974
American Forests - June 1975
Environmental Education Report - June 1975

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE:

This all depends on local/federal funding. Program now dependent on local donations. Expectations for fiscal 1977 seem good.

CARIBBEAN INTEGRATED SCIENCE CURRICULUM (CISC)

Mr. Colin Lancaster
Caribbean Regional Science Project
University of the West Indies, Cave Hill
Bridgetown, BARBADOS

Director: None
Project Duration: 1975-

Age: 14, 15, 16
Ability: above average
Subject: integrated science
Language: English
Translations: none
Testing of Students: written achievement tests

Materials Developed by Project: Print	Materials Developed by Project: Non-Print	Types of Learning Experiences:
Not answered	Not answered	Not answered

PRINCIPAL PROFESSIONAL STAFF:

Principal Initiator(s): Caribbean Regional Organization of Associations for Science Education (CROASE).

Reason(s) for Project Initiation: Caribbean Examinations Council has put integrated science as one of its priorities.

Evolution and Development of the Project: It began at the UNESCO/CEDO workshop in October, 1973 on integrated science and teacher education. Their suggestions were adopted at the CROASE Workshop in Barbados in December 1975 and at the same time it was decided that each country in the region would make its contribution to the curriculum. Between these two events the Caribbean Examinations Council announced integrated science as one of its priorities.

PROJECT OBJECTIVES:

Overall Project Purpose: Students will consider society as a subject for scientific analysis and the social impact of science.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: The upper ability range, probably, equivalent to GCE O level, but details not yet finalized.

Ways in which it differs from similar or previous programs: Societal emphasis and age and ability level.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

First drafts of objectives beginning to come in.

PRESENT COMMERCIAL AFFILIATIONS: Not yet finalized.

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: Possibly a textbook.

TEACHER PREPARATION:

Pre-service and In-service Training: Curriculum writing, meetings and workshops.

PROJECT EVALUATED:

Yes _____ No __X__ Internal _____ External Agency _____

PROJECT PUBLICITY:

Reay, J. F. (Ed) Integrated Science and Teacher Education Trinidad: UNESCO/UWI, 1974, pp. 109-141, an O-Level Integrated Science Curriculum.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE: Not yet finalized.

PATTERNS OF ENQUIRY PROJECT (POEP)

Department of Curriculum
The Ontario Institute for
Studies In Education
252 Bloor Street West
Toronto, Ontario M5S 1V6
CANADA

Telephone: 416-923-6641 Ext. 625

Director: F. Michael Connelly

Project Duration: 1971-1976

Age: 14-adult
Ability: average, above average
Subjects: biol, chem, physics
Language: English
Translations: none
Testing of Students:
written achievement tests
teacher judgments

Materials Developed by Project:

Print	Non-Print
Textbooks	Films
Tchr. Manuals	Games

Types of Learning Experiences:
Discussion

PRINCIPAL PROFESSIONAL STAFF: Not answered

PROJECT HISTORY:

Principal Initiator(s): F. Michael Connelly

PROJECT OBJECTIVES:

Overall Project Purpose: Development and dissemination of modular science units at the secondary level, based on original scientific research reports.

Specific Objectives: Investigation of relationships among approach to scientific enquiry, teaching methodology and materials, and student learnings. Development of materials suitable to an enquiry approach to science.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Secondary level science students.

Ways in which it differs from similar or previous programs: Modular format of materials: they are intended as an alternative for teacher choice, not as a complete course of study. The methodology of 'guided discussion' recommended to teachers.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Connelly, G. (edited by B. Kilbourn), Hominid Evolution: Theories and How they are Formulated, OISE, Spring 1976. With teachers' edition.	Not Given	OISE
Finegold, M., From Visual Rays to Particles: The Development of Theory in Optics, OISE, Spring 1976. With teachers' edition.	Not Given	OISE
Finegold, M., Particles versus Waves: Two Explanations for the Transmission of Light, OISE, Spring 1976. With teachers' edition.	Not Given	OISE
Patterns of Enquiry Project Staff, Honey Bee Communication: Two Explanations for Animal Behavior, OISE, Spring 1976. With teachers' edition.	Not Given	OISE
Finegold, M. & Oliver, H. Ordering the Elements: A Classification Puzzle, OISE, Spring, 1976	Not Given	OISE
Connelly, F. M., Wahlstrom, M. W., Finegold, M. & Elbaz, F., Enquiry Teaching in Science: A Handbook for Secondary School Teachers, OISE, Fall 1976.	Not Given	OISE

POEP (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material	Cost	Source
Connelly, F.M., Finegold, M., Clipsham, J. & Wahlstrom, M.W., Scientific Enquiry and the Teaching of Science, OISE, Fall 1976.	Not Given	OISE
Film "Enquiry into Enquiry" (16mm, sound, color, 23 min.) is available on loan from OISE's Audio-Visual Department in the Library. The film describes a technique for the use of the enquiry materials.	On Loan	OISE

PRESENT COMMERCIAL AFFILIATIONS:

The Ontario Institute for Studies in Education (OISE)
252 Bloor Street
Toronto, Ontario
M5S 1V6

Date of latest edition: Summer 1976

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION:

Pre-service and In-service Teaching Materials: Film "Enquiry into Enquiry" and manuals.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

In-House or Unpublished Research: Science Enquiry & Science Instruction, Report to the Canada Council, July 1974.--This study was an exploratory investigation into selected aspects of science curriculum, involving (a) conceptions of the nature of scientific enquiry and the impact of these conceptions on science education, and (b) an investigation into curriculum development processes within the context of the main body of the research.

PROJECT PUBLICITY:

Connelly, F. M., Enquiry Materials in Science Teaching: Parts I, II, III. The Crucible, February, April, June, 1970.
Finegold, M. & Connelly, F. M., Patterns of Enquiry in Science Education. Orbit, Vol. 3, No. 1, February 1972.
Connelly, F. M., The Patterns of Enquiry Project: An Overview. The Crucible, March 1973.
Olson, J.D., Enquiry into Enquiry in the Classroom. The Crucible, May 1973.
Binns, R.W., Patterns of Enquiry: Textual Analysis of a Classroom Discussion Unit on Bee Feeding Behavior. The Crucible, June 1973.
Finegold, M., Instructional Goals and Classroom Reality: A Limited Analysis. The Crucible, September 1973.
Clipsham, J., Goals and Means in Courses on Science and Society, The Crucible, September 1974.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

AIDS TO INDIVIDUALIZE THE TEACHING OF SCIENCE (AITS)

Frederick County Board of Education
115 East Church Street
Frederick, Maryland 21701
U.S.A.

Telephone: (301) 662-9200

Director: Marvin G. Spencer

Project Duration: 1973-1974

Age: 13-18
Ability: all
Subject: biol, chem, phys, earth-space
Language: English
Translations: none
Testing of Students: written achievement tests, lab performance tests, oral tests

Materials Developed by Project:

Print	Non-Print
Textbooks	Games
Lab Books	
Activity Sheets	
Tchr. Manuals	
Behavioral Objectives	

Types of Learning Experiences:

- Lecture
- Discussion
- Self-Paced
- Lab Activities
- Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Secondary science teachers identified on the back of each mini-course.

PROJECT HISTORY:

Principal Initiator(s): Marvin G. Spencer and Albert Thackston

Reason(s) for Project Initiation: To facilitate the individualization of instruction in the Frederick County science curriculum.

Evolution and Development of the Project:

1. Budget request made during the fall of 1972
2. Funding was approved in the spring of 1973
3. Writers were selected from science teachers in the County and a committee was formed to plan for the summer writing session
4. Summer 1973 - 17 mini-courses for the junior student were written
5. Summer 1974 - revision of 1973 mini-courses, improvements in design, writing of 17 more mini-courses for senior high students

PROJECT OBJECTIVES:

To provide a more individualized and flexible approach to the teaching of science; to provide short courses that will make a science program more interesting and relevant; to write mini-courses about a variety of topics that have been somewhat difficult for teachers to teach, related to the broad areas of life, earth and physical sciences. The units vary in length from several days to eight weeks. To write a number of mini-courses related to physical science, biology, chemistry, physics and science survey.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: It is felt that the courses are appropriate for all socio-economic levels, are multi-cultural, and can be utilized by all intellectual levels at the high school level (ages 13-18).

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Life Science (7th grade)		
A Study for the Birds	all items $1.00 per mini-course	all items from Frederick County
Creepy Critters (snakes)		
How's Your Plumbing?		
Guess Who's Been Here for Dinner		
Plants - The "Other" Living Things		

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material	Cost	Source
Life Science: (continued)	all items $1.00 per mini-course	all items from Frederick County
Let's Look at You - The Human Organism		
Classification: Why is There a Need?		
Protist: The "Unseen" Kingdom		
Earth Science (8th grade):		
Coastline Development		
Ocean Currents		
Features of the Ocean Floor (Ocean Floor Topography)		
Space and Its Problems		
Invertebrate Fossils: Clues to the Distant Past		
An Attempt towards Independent Study in Astronomy		
Physical Science (9th grade):		
Household Chemistry		
Notions on Motions		
Environmental Chemistry		
Electricity: Part I (Types of Generation of Electricity)		
Electricity: Part II (The Control and Measurement of Electricity)		
Electricity: Part III (Applications for Electricity)		
Can You Hear My Vibes? (A Mini-Course on Sound)		
Lenses and Their Uses		
What Is It? - Identification of an Unknown Chemical Substance		
Biology (10th grade):		
A Very Complex Molecule: D.N.A., The Substance that Carries Heredity		
Controlling the Code of Life		
Paleo Biology - Bones: Clues to Mankind's Past		
A Field Study in Human Ecology		
Basic Principles of Genetics		
Human Genetics - Mendel's Laws Applied to You!		
Science Survey (11th or 12th grade):		
Weather Instruments		
Topographic Maps		
Chemistry (11th grade):		
Water		
Physics (12th grade):		
Physical Optics		

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None are free except to certain agencies or counties.

ADDITIONAL MATERIALS BEING DEVELOPED: None

TEACHER PREPARATION:

Consultant Services: Available upon request.

Pre-service and In-service Training: None

Pre-service and In-service Teaching Materials: None

PROJECT EVALUATED:

Yes X No _____ Internal X External Agency _____

Name of Outside Evaluators: None

Pertinent Research Studies: None

PROJECT EVALUATED: (continued)

In-House or Unpublished Research: Evaluation sheets are included in each minicourse and as the courses were used the teachers were encouraged to complete them and to include recommendations for improvement.

Availability of Evaluative Data: Contact the project director.

PROJECT PUBLICITY: None

PROJECT ACTIVITIES SINCE 1974 REPORT: Project completed

PLANS FOR THE FUTURE: Have requested funds to continue curriculum development in this area.

ANTHROPOLOGY CURRICULUM PROJECT (ACP)

107 Dudley Hall
University of Georgia
Athens, Georgia 30602
U.S.A.

Telephone: (404) 542-7265

Director: M. J. Rice

Project Duration: 1964 -

Additional information; see also
Clearinghouse Reports: 7, 8, 9

Age: 6-18
Ability: all
Subject: anthropology
Language: English
Translations: none
Testing of Students:
  written achievement tests
  student attitude questionnaire

Materials Developed by Project:

Print
- Textbooks
- Supplementary Books
- Activity Sheets
- Tchr. Manuals
- Eval. Materials (tests)
- Overview of Project

Non-Print
- Films
- Audiotape

Types of Learning Experiences:
- Lecture
- Discussion
- Independent Study
- Field Experiences

PRINCIPAL PROFESSIONAL STAFF:

M. J. Rice, Director

PROJECT HISTORY:

Principal Initiator(s): M. J. Rice and W. C. Bailey

Reason(s) for Project Initiation: Develop new course

Evolution and Development of the Project:

The Anthropology Curriculum Project was funded by the United States Office of Education in 1964, as part of Project Social Studies. Federal funding terminated in 1968, but curriculum development and research have continued with support from the College of Education.

PROJECT OBJECTIVES:

The original goal of the Project was a sequential curriculum in Anthropology for grades 1-7.

Specific objectives include the development of systematic instructional materials in anthropology for the elementary grades, provision of a conceptual scheme for cross cultural studies, and the development of a curriculum which enables the student to reach a more complete understanding of his own culture through the study of other cultures.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Ways in which it differs from similar or previous programs: The uniqueness of the Project stems from its subject matter and its stress on the teaching of anthropology in the elementary grades. In recent years the Anthropology Curriculum Project has broadened its objectives to include the development of materials for the upper middle and high school grades.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Archaeological Methods	$3.00	ACP
Changing World Today: Cultural Change in Japan, Kenya and India	$8.00	ACP
Concept of Culture (Introductory Unit)	$3.00	ACP
Concept of Culture (level 1-2)	$5.00	ACP
Concept of Culture (level 4-5)	$5.00	ACP
Development of Man and His Culture: New World Prehistory	$8.00	ACP

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material	Cost	Source
Development of Man and His Culture: Old World Prehistory	$8.00	ACP
Evolution	$3.50	ACP
Language	$3.00	ACP
Life Cycle	$4.00	ACP
Pre-collegiate Anthropology: Trends and Materials	$3.00	ACP
Race, Caste, and Prejudice	$5.00	ACP
Cultural Change in Mexico and The United States (3 volumes)	$5.00	ACP
Education for American Indians	$5.00	ACP

PRESENT COMMERCIAL AFFILIATIONS:

International Film Bureau
332 South Michigan Avenue
Chicago, Illinois 60604

Date of latest edition: 1976

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

Cultural Change in Mexico and The United States - available Summer 1976
Cultural Change in Western Samoa - available January 1977
Native Indians Of The Southeast - available January 1977

TEACHER PREPARATION:

Not answered

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Name of Outside Evaluators: None

Pertinent Research Studies:

Frech, W. P., Jr. 1973. The Effects of the Anthropology Curriculum Project Material, The Concept of Culture, On the Ethnocentric Attitudes of Specific Fourth Grade Children. Unpublished Doctoral Dissertation, University of Georgia.

Rice, M. J., and W. C. Bailey, Sept. 1972. The Development of a Sequential Curriculum in Anthropology, Grades 1-7. Final Report: Dept. of Health, Education and Welfare Project No. 2-D-031, Grant No. OEG-4-72-0017.

Rice, M. J., B. R. Barnes, and E. U. Clawson. Sept. 1972. The Effect of the Position of Organizers on the Learning of Structured Anthropology Materials in Grades Three and Six. Final Report: Dept. of Health, Education and Welfare, Project No. 2-10-031, Grant No. PEG-4-72-0017.

In-House or Unpublished Research: Not answered

Availability of Evaluative Data:

Reports of empirical research involving classroom use of the Anthropology Curriculum Project materials are available from the Project. Write for list.

PROJECT PUBLICITY:

Bailey, W. C. 1968. Anthropology in the Elementary School. Scholastic Teacher.

Rice, M. J. 1970. Pilot Project: Anthropology Curriculum Project. Grade Teacher. 166-170.

PROJECT PUBLICITY: (continued)

Rice, M. J., and W. C. Bailey. 1965. A Sequential Curriculum in Anthropology for Grades 1-7. Social Education.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Publication of monographs:
(1) Wolcott, Harry F. Ethnographic Approaches to Research in Education, A Bibliography; (2) Dynneson, Pre-collegiate Anthropology: Trends and Materials; (3) Dwyer-Schick, The Teaching of Anthropology: An Annotated Bibliography.

PLANS FOR THE FUTURE::

Plans for the future include development of materials in cultural change in Mexico and the United States, using a socio-historical approach. The Cultural Change unit will eventually appear in a Spanish-English edition for use in the South-West and Northern Mexico. Additionally, units are being prepared in cultural change in Western Samoa and native Indians of the Southeast.

THE AVIOLOGY CONCEPT PROGRAM

Aviology Concept Program
P.K. Yonge Laboratory School
University of Florida
Gainsville, Florida 32611
U.S.A.

Telephone: (904) 392-1526

Directors: P.A. Becht/T. Gadsden Jr.

Project Duration: 1974-1976

Age: 14-18
Ability: all
Subject: biol, chem, phys, earth-space, math, soc. sciences, unified with aviation focus
Language: English
Translations: none
Testing of Students: written achievement tests, lab performance tests, oral tests, teacher judgments

Materials Developed by Project:

Print
- Lab Books
- Supplementary Readings
- Activity Sheets
- Tchr. Manuals
- Field Guides
- Eval. Materials
- Behavioral Objectives
- Overview

Non-Print
- Overhead Trans
- Lab Equipment

Types of Learning Experiences:
- Lecture
- Seminar
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Demonstrations
- Simulations

PRINCIPAL PROFESSIONAL STAFF:

Principal Initiator(s): P.A. Becht, T. Gadsden, Jr.

Reason(s) for Project Initiation: Need for motivational materials in science.

Evolution and Development of the Project: The program was originally conceived as a way to teach physical concepts in an exciting way to students who would not normally study physics. The result of this effort (10 modules) was tested in five Florida schools with positive results.

PROJECT OBJECTIVES:

Overall Project Purpose: To motivate students in science and related fields.

Specific Objectives: 1) To provide students with an interdisciplinary program that will motivate them toward a better understanding of the world around them and how to cope with that world; 2) To personalize education by using various instruments (i.e., cognitive mapping techniques and Myer-Briggs personality typing) to identify the most effective and efficient modes of learning for an individual and then to prescribe an optimum set of learning experiences.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students in grades 9-12.

Ways in which it differs from similar or previous programs: No other projects of this nature known.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
The Aviology Concept Program consists of 10 interdisciplinary modules:	Not Given	P.K. Yonge Laboratory School

Man's Preoccupation With Flight
Getting From One Place to Another
Building A Plane
The Science Of Moving Purposefully Through The Air
Anatomy of Weather
The Physical Effects of Flight on People
Contemporary Aviation
Effects of Aviation on Society
Careers With Aviation
Environmental Ramifications of Aviation
An Outline of Each Module is Listed in the Paper Entitled "The Aviology Concept Program"

THE AVIOLOGY CONCEPT PROGRAM (2)

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: "The Aviology Concept Program: available from authors at P.K. Yonge Laboratory School.

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION:

Consultant Services: Pre-service and in-service workshops.

Pre-service and In-service Training: In-service workshop presently being offered during 1975-76 school year in Florida. Three credits given for participation at total cost of $5.00. Participants supply transportation and per diem.

Pre-service and In-service Teaching Materials: None available yet

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency X

Name of Outside Evaluators: Florida Educational Research and Development Council

Pertinent Research Studies: In preparation

In-House or Unpublished Research: In preparation

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

BIOLOGICAL SCIENCES CURRICULUM STUDY - HUMAN SCIENCES PROGRAM (HSP)

Biological Sciences Curriculum Study
P.O. Box 930
Boulder, Colorado 80302
U.S.A.

Telephone: (303) 666-6558

Directors: William V. Mayer,
Norris M. Ross

Project Duration: 1971-1978

Additional information, see also
Clearinghouse Reports: 9

Age: 11-14
Ability: all
Subject: biol, chem, phys, earth-space, math, soc. sci., computer sci.
Language: English
Translations: none
Testing of Students: student attitude q're, logic, ego-development

Materials Developed by Project:

Print	Non-Print
Activity Sheets	Slides
Tchr. Manuals	Filmstrips
Eval. Materials	Filmloops
Newsletters	Overhead Trans.
Instructional Modules	Slide Tape
	Games
	Lab Equipment

Types of Learning Experiences:

Discussion
Independent Study
Lab Activities
Filed Experiences
Simulations
Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

James T. Robinson, Consultant
Abraham S. Flexer, Consultant
Mary C. McConnell, Consultant

PROJECT HISTORY:

Principal Initiator(s): William V. Mayer, Director, BSCS

Reason(s) for Project Initiation: The project resulted from a needs study conducted by the BSCS 1967-69 in the publication of guidelines for Life Sciences for the Middle School.

Evolution and Development of the Project: The rationale and three pilot modules were developed in the first 18 months of the project. Following modules have been produced and developed since that time.

Level I: BEHAVIOR, SURVIVAL, LEARNING, SENSE OR NONSENSE, GROWING

Level II: RULES, WHERE DO I FIT?, REPRODUCTION, PERCEPTION

Level III: CHANGE, FEELING FIT, INVENTION, SURROUNDINGS

PROJECT OBJECTIVES:

Overall Project Purpose: To develop an interdisciplinary curriculum based upon characteristics, needs, and interests of emerging adolescents. This interdisciplinary program to draw upon the natural and social sciences, designed to meet the full range of variability of children moving to adolescents, ages 11-14.

Specific Objectives:

1. to help students grow in logical thinking
2. to help students develop skills in problem solving, decision making, independent action
3. to help students develop the ability to take others' points of view
4. to help students increase their range of interests
5. to help students develop a variety of competencies
6. to help students grow in the ability to deal with ethical and social issues
7. to help students develop skills and criteria for self-evaluation

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: the emerging adolescent--the program is trying to reach the full range of students in grades 6-8 with special emphasis on students who are not academically oriented. Activities are provided at various cognitive & skill levels in order to reach a wide range.

Ways in which it differs from similar or previous programs: HSP differs from similar projects in that the year's program is divided into 4 or 5 modules. Each module contains the materials needed for students to conduct all the activities within the module. No activities are assigned, nor are activities sequenced. Students choose the activities they will do and choose the students with whom they will work. In effect, students develop their own curriculum choosing the activities they will do and the sequence in which they will be done.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Modules:	Cost	Source
Level I:		
Behavior	$190.00	BSCS
Learning	Not Given	BSCS
Growing	Not Given	BSCS
Sense or Nonsense	Not Given	BSCS
Survival	Not Given	BSCS
Level II:		
Rules		
Teachers Guide	8.00	BSCS
Where Do I Fit?	Not Given	BSCS
Teachers Guide	8.00	BSCS
Perception	225.00	BSCS
Teachers Guide	8.00	BSCS
Reproduction	Not Given	BSCS
Teachers Guide	8.00	BSCS
Level III:		
Change	Not Given	BSCS
Invention	Not Given	BSCS
Feeling Fit	Not Given	BSCS
Surroundings	Not Given	BSCS

PRESENT COMMERCIAL AFFILIATIONS:

Biological Sciences Curriculum Study -- experimental materials
P. O. Box 930
Boulder, Colorado 80302 Attention: Scott Martin

Date of latest edition: 1976

MATERIALS AVAILABLE FREE: None, except BSCS Newsletters

ADDITIONAL MATERIALS BEING DEVELOPED: one other module: KNOWING for Level III

TEACHER PREPARATION:

Consultant Services: Staff consultants and experienced teachers are available on request to school districts using materials. Staff members of Dissemination & Implementation Centers also assist teachers using the materials.

TEACHER PREPARATION: (continued)

Pre-service and In-service Training: In-service Institutes have been conducted under the III Program of NSF. They have been financed through the NSF. Workshops can be arranged for inservice training upon request from the BSCS.

Pre-service and In-service Teaching Materials: Experimental materials are currently out of print and new materials are in preparation. No cost estimate is currently available.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Name of Outside Evaluators: None

Availability of Evaluative Data: write to HSP

PROJECT PUBLICITY: BSCS Newsletters 50, 53, 54, 56, 57, 63

PROJECT ACTIVITIES SINCE 1974 REPORT:

1. development of Level III modules
2. level II and level III modules have been tested in classrooms (approximately 7)--500 students each year.
3. evaluation data collected from the classroom testing is currently being processed and analyzed.

PLANS FOR THE FUTURE:

tentative plans for commercial publication sometime in 1977

BIOLOGICAL SCIENCES CURRICULUM STUDY - ME AND MY ENVIRONMENT (MAME)

Biological Sciences Curriculum Study
P.O. Box 930
Boulder, Colorado 80302
U.S.A.

Telephone: (303) 666-6558

Director: William V. Mayer

Project Duration: 1971-1976

Additional information, see also Clearinghouse Reports: 9

Age: 13-18
Ability: slow learner, educable mentally handicapped
Subject: biol, chem, phys, earth-space, environmental science
Language: English
Translations: none
Testing of Students: lab performance tests, oral tests, teacher judgments, student attitude q're., cognitive development and processes tests

Materials Developed by Project:

Print
- Supplementary Books
- Activity Sheets
- Tchr. Manuals
- Behavioral Objectives
- Newsletters
- Charts

Non-Print
- Slides
- Filmstrips
- Filmloops
- Overhead Transparencies
- Slide Tape
- Games
- Models
- Lab Equipment

Types of Learning Experiences:
- Discussion
- Lab Activities
- Field Experiences
- Demonstrations
- Simulations
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

Principal Initiator(s): M. H. Kennedy

Reason(s) for Project Initiation: To develop new course; science program for junior high EMH children did not exist.

Evolution and Development of the Project: The BSCS embarked on the task of producing life and environmental science materials for the educable mentally handicapped (EMH) in the summer of 1969. The project to develop the curriculum was originally funded by the Division of Research, Bureau of Education for the Handicapped, United States Office of Education. The project was charged with writing, field testing, evaluating, and disseminating learning programs and materials in the environmental sciences for populations of EMH children in our schools.

PROJECT OBJECTIVES:

Both ME NOW and ME AND MY ENVIRONMENT are student-centered activity programs that contain very little written materials for the students. The essential teaching materials are assembled into a teaching kit which, together with the comprehensive instruction manual, make it easy for the teacher to provide the student with carefully sequenced activities. If knowledge is acquired, at least in part, through an inquiry strategy, then the student should be able to use elements of that strategy in acquiring further information and solving future problems.

The broad aims of ME AND MY ENVIRONMENT include the development within each child of a sense of identity as a person who has some degree of control over his environment; of a success syndrome; of an interest that could become a hobby or avocation over a lifetime; of a sense of relationship and empathy with other living things; and of an understanding of environmental conditions that will lead to a sense of responsibility for the environment and actions that protect or improve it.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Field tests of the materials indicated that MAME materials are suitable in a broad range of socio-economic, cultural, and intellectual backgrounds among educable mentally handicapped students aged 13-18.

Ways in which it differs from similar or previous programs: The program is unique in the fields of science and special education in that none had previously existed in science for EMH children.

MAME (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Exploring My Environment (Investigating the Visible Environment, Landmarks in the Visible Environment, Sensing the Invisible Environment, Looking at the Invisible Environment) - Program Elements listed below:		Hubbard
Teacher's Guide--Lesson Plans	$50.	
35mm Daylight Projection Slides (60)	$75.	
Zoom In-Zoom Out--Filmstrip	$ 8.	
Some Houses--Filmstrip	$ 8.	
Some Sounds--Filmstrip	$16.	
Environmental Rummy Card Game (4)	$40.	
Posters	$ 5.	
Thermometer & Calendar Charts	$12.	
Environmental Sounds--Cassette	$ 8.	
Study Pictures (16)--Animals	$15.	
Study Pictures (16)--Plants	$15.	
Supplies--Glassware	$150.	
Complete Class Kit of Non-Expendable Materials All of the above items	$350.	
Student Worksheets--(30 pads)	$50.	
Chemicals & Expendable Supplies	$30.	
Student Assessment Record	$10.	
Complete Class Kit of Expendable Materials Chemicals-Worksheets-Student Record	$80.	
Optional Equipment:		
Equal Arm Balances (4)	$25.	
Microscope Viewers (4)	$75.	
Polaroid Camera	$30.	
Flash Cubes (12)	$10.	
Film (4 packs)	$20.	
Me as an Environment (Microbes and Me, Microbe Pest Control, Environmental Choices and Chances) Program Elements listed below:		Hubbard
Teacher's Guide--Lesson Plans	$50.	
Scrub & Spray--Filmstrip	$20.	
Drug--Filmstrip	$20.	
VD Booklets - Set of 16	$24.	
Drug Booklets - Set of 16	$24.	
Mind Puzzler Cards	$12.	
Stereo Cards & Glasses (8 sets)	$100.	
35mm Daylight Projection Slides (20)	$25.	
Supplies--Glassware	$125.	
Complete Class Kit of Non-Expendable Materials All of the above items	$350.	
Chemicals & Expendable Supplies	$30.	
Student Worksheets (18)	$40.	
Student Assessment Record	$10.	
Complete Class Kit of Expendable Materials Chemicals-Worksheets-Student Record	$70.	

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material	Cost	Source
Optional Equipment:		
Polaroid Camera (1)	$30.	
Flash Cubes (12)	$10.	
Film (4 packs)	$20.	
Microscope Viewers (4)	$75.	
Energy Relationships in My Environment (Introduction to Energy, Energy in Food, Energy Flow through Food Chains and Webs) - Program Elements listed below:		Hubbard
Teacher's Guide--Lesson Plans	$50.	
35mm Daylight Projection Slides (59)	$60.	
Film Strip--"Seeking The Source"	$20.	
"Nature's Delicate Balance" Booklets (16)	$24.	
"Food Chain" Game	$20,	
"Go & Grow" Game--3 Complete Games	$75.	
"Food Webs"--4 Sets of 3 Game Boards	$39.	
Flash Cards	$25.	
Energy Kit	$68.	
Supplies	$125.	
Complete Class Kit of Non-Expendable Materials All of the above items	$450.	
Chemicals	$9.	
Student Worksheets (21)	$40.	
Student Assessment Record	$10.	
Complete Class Kit of Expendable Materials Chemicals-Worksheets-Student Record	$50.	
Optional Equipment:		
Polaroid Camera (1)	$30.	
Flash Cubes (12)	$10.	
Film (4 packs)	$20.	
Microscope Viewers (4)	$75.	
Hot Plate	$12.	
Transfer and Cycling of Materials in My Environment (Teacher's Instructional Guide, Student Worksheets Daylite Blackboard Projection Slides)	Not Given	MAME
Some Cycles... A look at repetition (Study Cards, Supplementary Teacher's Guide)		
I'm the Very First Link: A look at recycling (Filmstrip, Cassette, Supplementary Teacher's Guide		
Anyone Can: A study in recycling (Game, Supplementary Teacher's Guide)		
The Long Journey (Student Booklet)		
Water and Air in My Environment (Teacher's Instructional Guide, Student Worksheets, Daylite Blackboard Projection Slides)		
The Water Cycle: Where it comes from (Study Cards, Supplementary Teacher's Guide)		
Water in My Environment: Its Use (Filmstrip, Supplementary Teacher's Guide)		

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material	Cost	Source
Water in My Environment: Its Abuse (Filmstrip, Supplementary Teacher's Guide)	Not Given	MAME
Air In My Environment: Clues, Uses, Abuses (Filmstrip, Supplementary Teacher's Guide)		
Water (Poster)		
The Water Cycle in Nature (Poster)		
Air (Poster)		
The Fate of the River (Student Booklet)		
The Water Cycle: Operating model (Model, Supplementary Teacher's Guide)		

PRESENT COMMERCIAL AFFILIATIONS:

Hubbard Scientific Company
P.O. Box 105
Northbrook, Illinois 60062

Date of latest edition: 1976

MATERIALS AVAILABLE FREE:

Informational brochures, reports, and reprints.

ADDITIONAL MATERIALS BEING DEVELOPED: None at present.

TEACHER PREPARATION:

Consultant Services: Assistance upon request from EMH staff at BSCS when possible and some provided by publishers.

Pre-service and In-service Training: 1975-1976 Implementation Institute for ME NOW and ME AND MY ENVIRONMENT funded by NSF. Staff members and institute participants have given informational and research presentations at local, state, and national meetings of science and special education groups.

Pre-service and In-service Teaching Materials: Not answered

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Name of Outside Evaluators: None

Pertinent Research Studies:

Biological Sciences Curriculum Study, 1974. ME AND MY ENVIRONMENT, life sciences: a special education program. Unit 1, Exploring my environment. Northbrook, Illinois: Hubbard Scientific Company.

Biological Sciences Curriculum Study, 1974. ME AND MY ENVIRONMENT, life sciences: a special education program. Unit 2, Me as an environment. Northbrook, Illinois: Hubbard Scientific Company.

Biological Sciences Curriculum Study, 1975. ME AND MY ENVIRONMENT, life sciences: a special education program. Unit 3, Energy relationships in my environment. Northbrook, Illinois: Hubbard Scientific Company.

Biological Sciences Curriculum Study, 1976. ME AND MY ENVIRONMENT, life sciences: a special education program. Unit 4, Transfer and cycling of materials in my environment. Northbrook, Illinois: Hubbard Scientific Company.

Biological Sciences Curriculum Study, 1976. ME AND MY ENVIRONMENT, life sciences: a special education program. Unit 5, Water and air in my environment. Northbrook, Illinois: Hubbard Scientific Company.

PROJECT EVALUATED: (continued)

Pertinent Research Studies: (continued)

BSCS Newsletters 46, 48, 50, 51, 53, and 55. Published by Biological Sciences Curriculum Study, P.O. Box 930, Boulder, Colorado.

Steele, Joe M. 1973a. Arranging field tests: characteristics of sites and students. ME AND MY ENVIRONMENT formative evaluation report 1. Boulder, Colorado: Biological Sciences Curriculum Study, June. 29 pp. EC 06 1292 or ED 087 190.

Steele, Joe M. 1973b. Assessing student abilities and performance: year 1. ME AND MY ENVIRONMENT formative evaluation report 2. Boulder, Colorado: Biological Sciences Curriculum Study, December. 44 pp. ED 087 191 or ED 061 293.

Steele, Joe M. 1974. Design and revision, data collection and portrayal. ME AND MY ENVIRONMENT formative evaluation report 3. Boulder, Colorado: Biological Sciences Curriculum Study, September. 53 pp. ED 100 122 or EC 071 063.

Gromme, Roy O. 1975. Assessing student abilities and performance: year 2. ME AND MY ENVIRONMENT formative evaluation report 4. Boulder, Colorado: Biological Sciences Curriculum Study, May. 34 pp. EC 080 112.

Callahan, William P. 1976. Assessing student abilities and performance: year 3. ME AND MY ENVIRONMENT formative evaluation report 5. Boulder, Colorado: Biological Sciences Curriculum Study, January. 32 pp.

Meyer, Don E.; Roy O. Gromme; and William P. Callahan. A synthesis of findings. ME AND MY ENVIRONMENT final formative evaluation report. Boulder, Colorado: Biological Sciences Curriculum Study, February. 24 pp.

Gray, William M. 1974. The integrated cognitive structures of EMH children. Paper presented at the fourth special invitational interdisciplinary seminar on Piagetian theory and its implications for the helping professions. Los Angeles. February.

Gray, William M. 1975. An integration of Piaget and criterion-referenced measurement. Paper presented at the annual meeting of the American Educational Research Association. Washington, D.C. April.

Heiss, Warren E., and George S. Mischio. 1971. Designing curriculum for the educable mentally retarded. Focus on exceptional children. Denver, Colorado. Volume 3, Number 2.

Mayer, William V., editor. 1975. Planning curriculum development: with examples from projects for the mentally retarded. Boulder, Colorado: Biological Sciences Curriculum Study. Ed 107 020 or EC 072 489.

Steele, Joe M. 1974. The relationship of developmental level with science performance: a case for an alternative to IQ grouping of mildly retarded children? Paper presented at the 1974 annual meeting of the American Educational Research Association. Chicago. April. EC 06 1990 or ED 091 876.

Steele, Joe M. 1975. A longitudinal and comparative look at cognitive development in EMH children. Paper presented at the 1975 annual meeting of the American Educational Research Association. Washington, D.C. March.

In-House or Unpublished Research:

Dissertations:

Dr. George E. Marsh: A Comparison of Black and White Mentally Retarded Children on Measures of Cognitive Ability, 1975, University of Northern Colorado.

Dr. Nels C. Sorensen: Comparison of Borderline and Mildly Retarded Subjects on Three Cognitive Levels of Behavior as Related to the Science Content Area, 1976, University of Northern Colorado.

PROJECT EVALUATED: (continued)

Availability of Evaluative Data: Data available upon request from BSCS director, Dr. William V. Mayer, and/or EMH director, Roy Gromme, or from ERIC.

PROJECT PUBLICITY:

Gromme, Roy. 1975. BSCS designs curricula to teach EMH youth to inquire. School and University Review. Volume 5, Number 3. Summer 1975. 3pp.

Menhusen, Bernadette R., and Roy O. Gromme. 1976. Science for handicapped children--why? Science and Children. Volume 13, Number 6. March. 4pp.

PROJECT ACTIVITIES SINCE 1974 REPORT:

1975-1976 - Summer Institute for ME NOW and ME AND MY ENVIRONMENT funded by NSF with 40 teachers and administrators trained for implementation and dissemination of information.

PLANS FOR THE FUTURE: Not answered

BIOLOGICAL SCIENCES CURRICULUM STUDY--ME IN THE FUTURE

Biological Sciences Curriculum Study
P. O. Box 930
Boulder, Colorado 80302
U.S.A.

Telephone: (303) 666-6558

Director: William V. Mayer

Project Duration: 1974-

Age: 14-18
Ability: Slow learner, EMH
Subject: biol, chem, phys, earth-space, careers
Language: English
Translations: none
Testing of Students: not answered

Materials Developed by Project:

Types of Learning Experiences:

PRINCIPAL PROFESSIONAL STAFF:

Roy O. Gromme and William P. Callahan, Project Co-Directors
Janet L. Mansfield, Special Education Consultant
Bernadette R. Menhusen, Evaluation & Dissemination Consultant
John R. Tarp, Materials Development Consultant

PROJECT HISTORY:

Principal Initiator(s): Roy O. Gromme

Reason(s) for Project Initiation: Develop a new curriculum that previously did not exist.

Evolution and Development of the Project: The BSCS embarked on and completed the task of producing life and environmental science materials for the upper elementary and junior high school educable mentally handicapped (EMH) student from the summer of 1969 through 1976. As a logical extension, the Division of Innovation and Development in the Bureau of Education for the Handicapped, United States Office of Education funded the BSCS for a four-year effort in developing a science program with a career emphasis for secondary EMH students. The project is charged with writing, field testing, evaluating, and disseminating this curriculum in career education.

PROJECT OBJECTIVES:

ME IN THE FUTURE aims to develop in the educable mentally handicapped a broad spectrum of science concepts and skills that will expand their career opportunities related to vocations, leisure time activities, and personal living skills.

More specifically the objectives are:

1. To facilitate the development of understanding in the educable mentally handicapped person of selected science concepts and skills that affect individual interests, survival skills, and positive attitudes towards life.
2. To provide the educable mentally handicapped person with challenging intellectual activities at levels commensurate with the individual's ability to participate in these activities successfully.
3. To aid the educable mentally handicapped person in establishing functional modes of living through critical thought, independent action, increased measures of self confidence, and a sense of responsibility for developing a productive role in society.
4. To aid the educable mentally handicapped person in acquiring a knowledge of science resources that apply to specific aspects of work and increase living skills, leading to an increased awareness of career opportunities.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Materials will be developed to be suitable to a wide variety of backgrounds in grades 10 - 12.

Ways in which it differs from similar or previous programs: It will be unique; there are none of this type in existence at the present time.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

None

PRESENT COMMERCIAL AFFILIATIONS:

None

MATERIALS AVAILABLE FREE:

None

ADDITIONAL MATERIALS BEING DEVELOPED:

None

TEACHER PREPARATION:

Consultant Services: Inservice for pilot field test teachers.

PROJECT EVALUATED:

Not answered

PROJECT PUBLICITY:

Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT:

Not answered

PLANS FOR THE FUTURE:

Summer writing conferences including teachers and scientists in summers of 1976 and 1977.

BIOLOGICAL SCIENCES CURRICULUM STUDY -- ME NOW

Biological Sciences Curriculum Study
P.O. Box 930
Boulder, Colorado 80302
U.S.A.

Telephone: (303) 666-6558

Director: William V. Mayer

Project Duration: 1969-1972

Additional information, see also Clearinghouse Reports: 9

Age: 10-14
Ability: slow learner, educable mentally handicapped (EMH)
Subject: biol.
Language: English
Translations: none
Testing of Students: written achievement, lab performance and oral tests; teacher judgments

Materials Developed by Project:

Print	Non-Print
Supplementary books	Slides
Activity Sheets	Filmstrips
Tchr. Manuals	Filmloops
Eval. Materials	Models
Behavioral Objectives	
Newsletters	
Charts	

Types of Learning Experiences:

Discussion
Lab Activities
Demonstrations
Audio-Visual

PRINCIPAL PROFESSIONAL STAFF:

Roy Gromme, Director of Science for the Handicapped Projects
Bernadette R. Menhusen, Director of EMH Projects' Implementation

PROJECT HISTORY:

Principal Initiator: M. H. Kennedy

Reason(s) for Project Initiation: To develop a new course; a science program for EMH children did not exist.

Evolution and Development of the Project: The BSCS embarked on the task of producing life science materials for the educable mentally handicapped (EMH) in the summer of 1969. The Project to develop the curriculum was originally funded by the Division of Research, Bureau of Education for the Handicapped, United States Office of Education. The project was charged with writing, field testing, evaluating, and disseminating learning programs and materials in the life sciences for populations of EMH children in our schools.

PROJECT OBJECTIVES:

Both ME NOW and ME AND MY ENVIRONMENT are student-centered activity programs that contain very little written materials for the students. The essential teaching materials are assembled into a teaching kit which, together with the comprehensive instruction manual, make it easy for the teacher to provide the student with carefully sequenced activities that range from the simple to the complex. Both programs utilize an inquiry strategy ("discovery" approach) in developing their sequences of activities. If knowledge is acquired, at least in part, through an inquiry strategy, then the student should be able to use elements of that strategy in acquiring further information and solving future problems.

The broad aims of ME NOW include the development of interests, skills, and positive attitudes; the provision of challenging intellectual activity commensurate with the student's ability; the enhancement of life through heightened observation, curiosity, self-confidence, and creative self-expression; the development by the student of a level of social maturity and emotional stability that can lead to increased vocational proficiency, realistic self-concept, creative self-expression, and effective assimilation into the community; and the application of knowledge to the tasks of everyday life.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Field tests of the materials indicated that ME NOW materials are suitable in a broad range of socio-economic, cultural, and intellectual backgrounds; and specifically for educable mentally handicapped children in grades four through six.

UNIQUE CHARACTERISTICS OF THE PROJECT: (continued)

Ways in which it differs from similar or previous programs: The program is unique in the fields of science and special education in that none had previously existed in science for EMH children.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Materials	Cost	Source
Unit 1 - Digestion and Circulation-Class Kit of Non-Expendable Materials, including slides filmloops, filmstrips, models	$170.00	Hubbard
Unit 1 - Digestion and Circulation-Class Kit of Expendable Materials,	50.00	Hubbard
Unit 2 - Respiration and Excretion-Class Kit of Non-Expendable Materials, including slides, filmloops, filmstrip	160.00	Hubbard
Unit 2 - Respiration and Excretion-Class Kit of Expendable Materials	50.00	Hubbard
Unit 3 - Movement, Support & Sensory Perception-Class Kit of Non-Expendable Materials, including slides, filmloop, filmstrip	95.00	Hubbard
Unit 3 - Movement, Support & Sensory Perception-Class Kit of Expendable Materials	41.00	Hubbard
Unit 4 - Growth and Development-Class Kit of Non-Expendable Materials, including slides, filmloop, filmstrip	122.00	Hubbard
Unit 4 - Growth and Development-Class Kit of Expendable Materials	41.00	Hubbard

PRESENT COMMERCIAL AFFILIATIONS:

Hubbard Scientific Company
P.O. Box 105
Northbrook, Illinois 60062

Date of Latest Edition: 1972

MATERIALS AVAILABLE FREE: Informational brochures, reports, reprints.

ADDITIONAL MATERIALS BEING DEVELOPED: None at present.

TEACHER PREPARATION:

Consultant Services: Assistance upon request from EMH staff at BSCS when possible and some provided by publishers.

Pre-service and In-service Training: 1975-76 Implementation Institute for ME NOW and ME AND MY ENVIRONMENT funded by NSF. Staff members and institute participants have given informational and research presentations at local, state, and national meetings of science and special education groups.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency X

Name of Outside Evaluators: Gallaudet School for the Blind

Pertinent Research Studies:

Biological Sciences Curriculum Study. 1972. ME NOW, life sciences: a special education program. Unit 1, Digestion and circulation. Northbrook, Illinois: Hubbard Scientific Company.

Biological Sciences Curriculum Study. 1972. ME NOW, life sciences: a special education program. Unit 2, Respiration and body wastes. Northbrook, Illinois: Hubbard Scientific Company.

PROJECT EVALUATED: (continued)

Pertinent Research Studies: (continued)

Biological Sciences Curriculum Study. 1972. ME NOW, life sciences: a special education program. Unit 3, Movement, support and sensory perception. Northbrook, Illinois: Hubbard Scientific Company.

Biological Sciences Curriculum Study. ME NOW, life sciences: a special education program. Unit 4, Growth and development. Northbrook, Illinois: Hubbard Scientific Company.

BSCS Newsletters 38, 43, 46, and 55. Published by Biological Sciences Curriculum Study, P.O. Box 930, Boulder, Colorado.

Tolman, Richard R.,James T. Robinson. 1970. A formative evaluation of ME NOW. Unit 1, Digestion & Circulation. Life sciences for the educable mentally handicapped. Boulder, Colorado: Biological Sciences Curriculum Study. EC 03 0165 or ED 043 182

Tolman, Richard R., James T. Robinson. 1972. A formative evaluation of ME NOW. Life sciences for the educable mentally handicapped. Final Report. Boulder, Colorado: Biological Sciences Curriculum Study, December. 305 pp. EC 05 0871 or ED 071 263

In-House or Unpublished Research: Two formative evaluations were accomplished and written up during the developmental period. These studies were geared towards evaluating the effectiveness of the curriculum in meeting the performance/behavioral objectives of the program.

Availability of Evaluative Data: Additional evaluative data is available upon request from BSCS director, Dr. William V. Mayer, and/or EMH director, Roy O. Gromme, or from ERIC.

PROJECT PUBLICITY:

Boekel, Norma, and Joe M. Steele. 1972. Science education for the exceptional child. Focus on exceptional children. Denver, Colorado. Volume 4, Number 4. September.

Grant, William D.; Joseph Rosenstein; and David L. Knight. 1975. A project to determine the feasibility of BSCS's ME NOW for hearing-impaired students. American annals of the deaf, February, p. 63.

Gromme, Roy. 1975. BSCS designs curricula to teach EMH youth to inquire. School and university review. Volume 5, Number 3. Summer 1975. 3 pp.

Menhusen, Bernadette R., and Roy O. Gromme. 1976. Science for handicapped children--why? Science and children. Volume 13, Number 6. March 1976. 4 pp.

PROJECT ACTIVITIES SINCE 1974 REPORT:

1975-76 Summer Institute for ME NOW and ME AND MY ENVIRONMENT funded by NSF with 40 teachers and administrators trained for implementation and dissemination of information.

PLANS FOR THE FUTURE:

We have submitted proposals for implementation of the programs from Bureau of Education for the Handicapped.

BIOMEDICAL INTERDISCIPLINARY CURRICULUM PROJECT (BICP)

1537 Webster Street
Oakland, California 94612
U.S.A.

Telephone: (415) 893-8138

Director: Leonard A. Hughes

Project Duration: 1968-1977

Additional information, see also
Clearinghouse Reports: 9

Age: 16-18
Ability: average, above average
Subject: biol, chem, phys, math, social sci., computer sci., medicine
Language: English
Translations: None
Testing of Students:
- written achievement tests
- teacher judgments
- student attitude q're

Materials Developed by Project:

Print	Non-Print
Textbooks	Overhead Trans.
Lab Books	Games
Tchr. Manuals	Lab Equipment
Eval. Materials	
Behavioral Objectives	
Overview	
Newsletters	

Types of Learning Experiences.
- Lecture
- Lab Activities
- Field Experiences

PRINCIPAL PROFESSIONAL STAFF:

Leonard Hughes, Project Director
Ronald Linder, Project Coordinator
Glenn Housh, Editorial Coordinator
Allen Vegotsky, Bioscience Curriculum Coordinator
Michael Weiner, Associate in Science Curriculum Development
Jon Hanshew, Mathematics Curriculum Coordinator
Richard Eckel, Associate in Mathematics Curriculum Development
William Hering, Jr., Social Science Curriculum Coordinator
Arnold Seibel, Social Science Editor
Glenna Gerard, Assistant, Science Curriculum Development
Robert Ziegler, Assistant, Science Curriculum Development
Jay Cherniak, Science Writer

PROJECT HISTORY:

Principal Initiator(s): J. French, L. Hughes

Reason(s) for Project Initiation: That portion of the gross national product expended in the medical and health sector increased from less than 4% in 1960 to 8.3% in 1975. In this same period, the number of different health careers approximately doubled to over 350. As a result of this growth, the need for both breadth and depth in medical and health science education has dramatically increased. The Biomedical Interdisciplinary Curriculum Project has addressed itself to this need as well as to the growing demand for relevant life-oriented interdisciplinary curricula.

Evolution and Development of the Project: Over the past seven years, BICP has developed, trial tested, and partially revised a health-career-oriented curriculum for high school students. This curriculum consists of courses in biomedical science, applied mathematics and social science, requiring a total of approximately 1400 hours of classroom teaching time.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop and disseminate a two-year interdisciplinary pre-college curriculum to prepare high school students for entry into training programs leading to a career in the health field.

PROJECT OBJECTIVES: (continued)

Specific Objectives:

1. To expand laboratory science offering in high school.
2. To develop an eleventh and twelfth grade biomedical interdisciplinary curriculum to motivate students to complete their high school education.
3. To provide students with basic scientific concepts and methodologies common to most disciplines in the health professions.
4. To offer these biomedical concepts in a manner that may stimulate students to pursue higher education and/or occupations in any of the health fields.
5. To provide students with a comprehensive preparation for education beyond the high school level.
6. To disseminate and implement the biomedical interdisciplinary curriculum.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: The curriculum is intended for those students, from all socio-economic and cultural backgrounds; who are interested in health, are able to make a two-year commitment to the program, have finished grade 10, have a reading level of grade eight or higher, have a C+ or higher overall high school grade coverage, and have completed one year of algebra with a grade equivalent to a C or higher.

Ways in which it differs from similar or previous programs:

1. Interdisciplinary
2. Comprehensive
3. Two-years in Duration
4. Applied
5. Process Oriented

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Science Student Text	not given	BICP
Science Teachers Manual	not given	BICP
Science Laboratory Manual	not given	BICP
Mathematics Student Text	not given	BICP
Mathematics Teachers Manual	not given	BICP
Social Science Student Text(s)	not given	BICP
Social Science Teachers Manual	not given	BICP
Biomedical Instrumentation Package Manual	not given	BICP
Biomedical Practicum Handbook	not given	BICP
Implementation Manual for High School Personnel	Free	BICP

PRESENT COMMERCIAL AFFILIATIONS: Not Answered

MATERIALS AVAILABLE FREE: Implementation Manual for High School Personnel

ADDITIONAL MATERIALS BEING DEVELOPED: Not Answered

TEACHER PREPARATION:

Pre-service and In-service Training: Informational workshops (1-2 days) and Pre-service orientations (1 day).

Pre-service and In-service Teaching Materials: Instructors Manual $4.50/unit.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

PROJECT PUBLICITY:

Hanshew, Jon, "Biomedical Interdisciplinary Curriculum Project," Mathematics Teacher, December 1975.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Trial completed in spring 1975. Revision of curriculum started spring 1975. Three national informational workshops held during winter 1976. Implementation of the curriculum in fall 1976 is projected for 50 schools.

PLANS FOR THE FUTURE:

Revision of the curriculum to be completed by March 1977 with NSF support. Plans to procure a publisher are now under way.

BROAD SPECTRUM ENVIRONMENTAL EDUCATION PROGRAM (BSEEP)

Center for Environmental Learning
615 Seminole Drive
Rockledge, Florida 32955
U.S.A.

Telephone: (305) 636-6543

Director: Marjorie Ebersbach

Project Duration: 1971-1977

Additional information, see also Clearinghouse Reports: 9

Age: 5-18
Ability: all
Subject: biol, earth-space, math, social sciences, language arts
Language: English
Translations: none
Testing of Students: written achievement tests, teacher judgments, student attitude questionnaire

Materials Developed by Project:

Print
- Programmed Units
- Activity Sheets
- Tchr. Manuals
- Eval. Materials
- Behavioral Objectives
- Overview

Non-Print
- Slides
- Filmstrips
- Audiotape
- Games

Types of Learning Experiences:
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Simulations
- Demonstrations
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

Roger L. Henry, Training Specialist

PROJECT HISTORY:

Principal Initiator(s): Brevard County School Board

Reason(s) for Project Initiation: To develop environmental learning materials to supplement existing courses.

Evolution and Development of the Project:

1. Developed materials - 1971-72
2. Field tested materials - 1972-73
3. Revised materials - 1973-74
4. Demonstrate use of materials - 1974-77
5. Diffuse information about project - 1974-77
6. Train teachers in material use - 1974-77

PROJECT OBJECTIVES:

Overall Project Purpose: To develop learners who: a) have an increased positive attitude toward the environment, and b) have an increased level of knowledge about the environment.

Specific Objectives: To produce interdisciplinary learning materials for students in grades K-12.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Learning materials directed to students of all intellectual and cultural levels in grades K-12.

Ways in which it differs from similar or previous programs: Classroom teachers used in development of materials. Learning materials to supplement existing courses. Interdisciplinary in nature; inquiry oriented; action centered.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Learning Materials:		BSEEP
Primary CEL Blocks, Teacher's Guide	$5.50	
Intermediate CEL Blocks, Teacher's Guide	6.00	
The Barrier Beach as an Ecosystem	3.50	
The City as an Ecosystem	2.45	
The Estuary as an Ecosystem	1.45	

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material	Cost	Source
Learning Materials:		BSEEP
The Freshwater Marsh as an Ecosystem	$4.15	
Energy and Power	1.10	
Local Government and Our Environment	2.75	
Responsible Social Action Toward Our Environment	3.00	
Technology and Our Environment	3.00	
The Automobile	1.55	

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: Training Manual

TEACHER PREPARATION:

Consultant Services: Demonstration class in which to observe material use.

Pre-service and In-service Training: Demonstration classes free to visitors. Workshops for training teachers--only a minimal purchase of materials required. Conferences held, at no charge, for implementing and monitoring. Testing instruments provided free to adoptors.

Pre-service and In-service Teaching Materials: Currently developing a teachers' training manual.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency X

Name of Outside Evaluators: Validation Team from the U.S.O.E.

Pertinent Research Studies: None

In-House or Unpublished Research: Treatment and comparison groups of students selected to test original materials. Pre and post-tests administered. Results were analyzed and found to be statistically significant.

Availability of Evaluative Data: Contact project director.

PROJECT PUBLICITY:

Florida Schools, February 1975, pp. 9-12, Department of Education, Knott Building, Tallahassee, Florida 32304, U.S.A.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Demonstrating materials' use for visitors. Diffusing information about project through presentations at professional meetings. Training teachers who have purchased materials.

PLANS FOR THE FUTURE:

For 1976-77, emphasis placed on training teachers in Florida who have purchased materials.

CALCULUS BASED PHYSICS MODULES (CBP)

213 Ferguson Hall
University of Nebraska
Lincoln, Nebraska 68588

Telephone: (402) 472-2790

Director: Robert Fuller

Project Duration: 1975-

Age: 18+
Ability: above average
Subject: physics
Language: English
Translations: none
Testing of Students:
written achievement tests

Materials Developed by Project:

Print	Non-Print
Programmed Units Tchr. Manuals	

Types of Learning Experiences:

Not answered

PRINCIPAL PROFESSIONAL STAFF:

Robert G. Fuller, Director
Albert A. Bartlett
Thomas C. Campbell
Harold Q. Fuller

PROJECT HISTORY:

Principal Initiator(s): Robert G. Fuller

Reason(s) for Project Initiation: To provide physics departments across the country with an additional, accessible resource for calculus-based physics courses.

Evolution and Development of the Project: Each of the 15 participants in the CBP Workshop, held in Colorado during the summer of 1975, contributed materials used in his own student-tutored, mastery-oriented general physics course based on calculus. From the study units, discussion questions, review units, and exams made available through this resource, a comprehensive set of materials called CBP was generated. Funded by NSF.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop and disseminate study modules for calculus-based general physics.

Specific Objectives: To provide a resource that can have a variety of classroom applications. When used in lecture-recitation courses, these modules can provide enrichment and additional materials for outside classroom work. They also can be used to offer an alternative self-paced style of instruction for calculus-based physics. Since development of systems of personalized instruction is extremely time consuming for individual schools, the National Science Foundation has funded the CBP Workshop as a means of making high-quality, student-tested modules available throughout the nation. The CBP Modules are the result of a total of 20 years of testing by the Workshop participants.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: College students

Ways in which it differs from similar or previous programs:

Complete Set of Mastery Exams and Grading Key (Three equivalent exams for each module)
Student Practice Exams
Supplementary Student Exercises with Detailed Solutions
Keyed Directly to Popular Physics Textbooks
Open Copyright

CBP (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
CBP Modules, consisting of 45 study modules, 3 Mastery tests for each module, a complete grading key, and an instructor's guide	$15 per module	CBP Workshop

The modules are directly keyed to the four most commonly used calculus-based physics textbooks, and are readily adaptable to many other similar texts. 42 of the 45 modules are complete.

Note: Since there is an open copyright, purchaser may order one copy and duplicate it as needed. The price of $15.00 is to partially cover reproduction and mailing cost. One of the purposes of this project is to disseminate materials as widely as possible, on a non-profit basis.

PRESENT COMMERCIAL AFFILIATIONS: Not answered

MATERIALS AVAILABLE FREE: Not answered

ADDITIONAL MATERIALS BEING DEVELOPED: Completion of study modules.

TEACHER PREPARATION:

Consultant Services: Instructor's Manuals

PROJECT EVALUATED:

Yes _____ No X Internal _____ External Agency _____

In-House or Unpublished Research:
During the Workshop, there has been student feedback concerning the level of clarity in each topic.

PROJECT PUBLICITY: Not answered

PLANS FOR THE FUTURE: Continued dissemination and evaluation of modules.

CAREER ORIENTED PRE-TECHNICAL PHYSICS (COPP)

Director of Science and Health
3700 Ross Avenue - Box 53
Dallas, Texas 75204
U.S.A.

Telephone: (214) 828-1450 EXT. 60

Director: Jesse M. Harris
Project Duration: 1973-1976

Age: 16-18
Ability: average
Subject: physics, career physics
Language: English
Translations: none
Testing of Students: written achievement tests, student attitude questionnaire, interest inventories

Materials Developed by Project:

Print	Non-Print
Tchr. Manuals	Audiotape
Modules	

Types of Learning Experiences:
Independent Study
Lab Activities

PRINCIPAL PROFESSIONAL STAFF:

Jesse M. Harris, Director
Dr. Walt Elliott, Consultant/Editor

PROJECT HISTORY:

Principal Initiator(s): Jesse M. Harris

Reason(s) for Project Initiation: Because fewer than 7% of Dallas Independent School District graduates were completing a physics course of any kind, it was believed that a career oriented pre-technical course might increase physics enrollments.

Evolution and Development of the Project: 30 Modules and 1 Teacher's Guide have been developed and printed.

PROJECT OBJECTIVES:

Overall Project Purpose: To alleviate the drastic decrease in enrollments in physics; to provide a high school science program which utilizes individualized modules; to provide educational opportunities in physics which stress environmental awareness and responsibility, consumer education, and career education; and, to provide a variety of validated teaching strategies for teachers to use in physics.

Specific Objectives: Preparing students for existence in a technology-oriented society, offering students choices in education, and reversing decreasing physics enrollments.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Average high school students

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Physics Modules: (modules are not purchasable, but efforts are underway to make them available at cost)	--	--

Automobile Ignition System
Basic Machines, The "Nuts" and Bolts" of Technical Physics
Climatizing the Home
Introduction
Introduction to Ballistics
Metric System
Photography
Physics of Communication
Physics of Musical Instruments
Physics of Sports

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material
Physics of Toys
Science and Superstition
Slide Rule
Teacher's Guide
Color
Electronics as a Hobby
"Let There Be Light"
Matter: A First Approach
Model Rocketry
Nuclear Energy
Radio Receivers
Radioactivity and People
So You "Gotta" Wear Glasses
Technical Research
Water, Water Everywhere
Would You Like to Swing on a Star?
Behavior of Electricity
Behavior of Gases
Geophysics
Man and Motion
Stereo Sound and Acoustics
Work, Power and Energy

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: Course Descriptions

ADDITIONAL MATERIALS BEING DEVELOPED: None

TEACHER PREPARATION:

Consultant Services: Four teachers available at $100/day plus expenses.

Pre-service and In-service Training: Awareness Workshops designed for 1-day conferences.

Pre-service and In-service Teaching Materials: One set of material (30 modules plus a Teacher's Guide). Approximate cost: $75.00.

PROJECT EVALUATED:

Yes X No _____ Internal X External Agency X

Name of Outside Evaluators: USOE Validation Team

Pertinent Research Studies:
DISD, Department of Research, Evaluation, and Information Systems Research Report No. 75-599.
DISD, Department of Research and Evaluation, Research Report 1973-74 No. 74-292.

In-House or Unpublished Research: This program was developed as a non-technical physics course to meet the needs of students without strong mathematics and science backgrounds; not as a technical, college preparatory physics course. It should be used as an alternative to the college preparatory physics course for students who are not technically oriented, not as a substitute for the college preparatory physics course. The modules should be made available to students with special interest in any of the topics included.

Availability of Evaluative Data: Contact project director.

PROJECT PUBLICITY: Article due for publication this year in American Journal of Physics.

PROJECT ACTIVITIES SINCE 1974 REPORT: None

PLANS FOR THE FUTURE:

Will be used in some DISD Schools in 1976-77. Will be used at our San Diego, California Test Center (Will Crawford High School) in 1976-77.

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CHEMICAL BOND APPROACH PROJECT REVISION (CBA)

Brown University
Providence, Rhode Island 02912
U.S.A.

Telephone: (401) 863-2737

Directors: L.E. Strong
L.B. Clapp

Project Duration: 1964-1977

Additional information, see also Clearinghouse Reports: 9,7,6,5,4,3,2

Age: 16+
Ability: all, avg+
Subject: chem
Language: English
Translations: Spanish, Japanese, Portuguese
Testing of Students: Not answered

Materials Developed by Project:

Print	Non-Print
Text Books Lab Guides	None

Types of Learning Experiences:

- Discussion
- Independent Study
- Lab Activities

PRINCIPAL PROFESSIONAL STAFF:

Revised Text: (Chemical Systems II,1976) K.E.Borst, L.B.Clapp, G.F.Martins, B.A.Peterson, R.M.Sherman, J.A.Spencer, R.M.Whitney

Revised Lab Guide: (Investigating Chemical Systems II,1977) Editor: L.B.Clapp; Authors: J.A.Spencer, E.Schultz

PROJECT OBJECTIVES:

To revise the Chemical Bond Approach to decrease the reliance on physics, particularly in the first 100 pages of the original CBA text, and to lower the reading level of the materials.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Chemical Systems II (CS II)	$7.50 + Postage	L.B.Clapp Chem. Department Brown University Providence R.I. 02912
Investigating Chemical Systems II (ICS II)	$4.00 + Postage	

MATERIALS AVAILABLE FREE: Prospectus on CS II and ICS II, both available from Project Director

ADDITIONAL MATERIALS BEING DEVELOPED: None

CHEMICAL ENGINEERING MODULAR INSTRUCTION (CHEMI)

CACHE Corporation
Room 12-88
77 Massachusetts Avenue
Cambridge, Massachusetts 02139
U.S.A.

Telephone: (617) 253-4580

Directors: Ernest Henley
William Heenan

Project Duration: 1975-1978

Age: adult
Ability: average
Subject: eng/tech, computer sci., ed tech
Language: English
Translations: none
Testing of Students: written achievement tests

Materials Developed by Project:

Print	Non-Print
Print Modules Supplementary Books Tchr. Manuals Eval. Materials Behavioral Objectives	None

Types of Learning Experiences:
Independent Study
Print Modules

PRINCIPAL PROFESSIONAL STAFF:

Not answered

PROJECT HISTORY:

Principal Initiator(s): Dr. Ernest Henley, Dr. William Heenan

Reason(s) for Project Initiation: The need for self-study material in chemical engineering sponsored by NSF, $144,000.

Evolution and Development of the Project: Evolved through efforts of the CACHE (Computer Aids for Chemical Engineering Education) Corporation.

PROJECT OBJECTIVES:

The overall project purpose is to produce and distribute self-study, single concept, text (print) modules in chemical engineering to cover the entire chemical engineering curriculum. From 50 to 100 modules are envisioned in each of 7 curriculum areas.

The specific objectives are student self-study and text-supplements. Once the modules are written, prerequisite skills will be traced (using a computer) and curriculum guides will be developed.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Undergraduate chemical engineering students and continuing education.

Ways in which it differs from similar or previous programs: This program has never been attempted in the field of chemical engineering.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

In process. 50 modules received to date, purchasable upon completion of project.

PRESENT COMMERCIAL AFFILIATIONS:

CACHE Corporation
Room 12-88
77 Massachusetts Avenue
Cambridge, Massachusetts 02139
U.S.A.

MATERIALS AVAILABLE FREE: Brochure

ADDITIONAL MATERIALS BEING DEVELOPED:

Curriculum guidelines for the modules.

CHEMI (2)

TEACHER PREPARATION:

Consultant Services: Each module contains a teacher's supplement which contains behavioral objectives, prerequisites, and solutions to all problems.

Pre-service and In-service Training: Workshops will be scheduled.

Pre-service and In-service Teaching Materials: None

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Name of Outside Evaluators: Other professors will evaluate each module before it is accepted.

In-House or Unpublished Research: Computer aided curriculum analysis is presently being developed using the principles of graph theory.

Availability of Evaluative Date: Not available.

PROJECT PUBLICITY: One article submitted to Chemical Engineering Education entitled The CHEMI Project, by W. A. Heenan and E. J. Henley.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Began in July, 1975
1. Organization meetings
2. Solicitation of authors
3. Writing and evaluating modules

PLANS FOR THE FUTURE:

To complete the modules on schedule with the curriculum guides

CITIZENS AND SCIENCE EDUCATION STUDY (CASE)

Department of Science Education
Teachers College
Columbia University
New York, New York 10027
U.S.A.

Telephone: (212) 678-3382

Director: Willard J. Jacobson

Project Duration: 1969-

Age: 5-adult
Ability: all
Subject: biol, chem, phys, earth-space, math, soc. sci, elementary science, philosophy
Language: English
Translations: none
Testing of Students: not applicable

Materials Developed by Project:

Print	Non-Print
Supplementary Books Teacher Manuals Reviews of Research Curriculum Analysis	None

Types of Learning Experiences:

Seminar
Discussion
Independent Study
Lab Activities
Field Experiences
Demonstrations
Simulations

PRINCIPAL PROFESSIONAL STAFF:

Willard J. Jacobson, Director
James Seawell, Research Associate

PROJECT HISTORY:

Principal Initiator(s): Willard J. Jacobson

Reason(s) for Project Initiation: To develop approaches to science education that will be more effective in preparing citizens for democratic societies.

Evolution and Development of the Project:

1. Basic rationale for project
2. Six volume reviews of research
3. Basic book on population education
4. Long range plans for study
5. Three basic research studies related to study

PROJECT OBJECTIVES:

Overall Project Purpose: To develop approaches to science education that will be more effective in preparing citizens for democratic societies.

Specific Objectives: To prepare basic materials exploring the nature of science, technology and education in democratic societies; to prepare a series of sourcebooks dealing with major problem situations that have significant scientific and technological dimensions (one book, Population Education has been completed); to prepare student materials on same topics as sourcebooks; to seek support to develop student materials on population; and to research relevant problems (six volume reviews completed).

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Elementary, secondary and community college students, teachers and citizens.

Ways in which it differs from similar or previous programs: The Citizenship Education Project did not go as deeply in problems with scientific and technological dimensions. We plan to prepare materials for teachers, students and citizens. Materials undergo formative evaluation.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
"Inquiry into Problems with Scientific and Technological Dimensions" (Offset)	Free	Project Director

CASE (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material	Cost	Source
Population Education--A Knowledge Base (In Press)	Not Given	TC Press
"Education for Societies in Transition", *Educational Trends* (March 1970)	Not Given	TC Press
A Digest of Investigations in the Teaching of Science (3 Vol.)	Not Given	TC Press
Reviews of Research in Science Education (3 Vol.)	Not Given	TC Press
"Fifty Years of Research in Science Education" in *Journal of Research in Science Teaching*. Vol. 12, No. 4, 1975.	Free	Project Director

PRESENT COMMERCIAL AFFILIATIONS:

Teachers College Press
Teachers College
Columbia University
New York, New York 10027

MATERIALS AVAILABLE FREE: From Project Director:

"Inquiry into Problems with Scientific and Technological Dimensions" (Offset)

"Fifty Years of Research in Science Education" in *Journal of Research in Science Teaching*. Vol. 12, No. 4, 1975.

ADDITIONAL MATERIALS BEING DEVELOPED:

1. A book--Science, Technology, and Education in a Democratic Society.
2. Student materials in population education.
3. Seeking support to develop additional sourcebooks for teachers.
4. Four research studies related to special problems.

TEACHER PREPARATION:

Consultant Services: Advice and consultant help on specific problems.

Pre-service and In-service Training: Limited in-service teacher training. Because of limited resources, activities must be user supported.

Pre-service and In-service Teaching Materials: See publications listed under Materials Already Produced above.

PROJECT EVALUATED:

Yes X No ____ Internal ____ External Agency ____

Name of Outside Evaluators: None

Pertinent Research Studies: Not answered

In-House or Unpublished Research: Formative evaluation with pre-service and in-service teachers. Subjected to critical reviews by advisory committee and seminars.

Availability of Evaluative Data: None

PROJECT PUBLICITY:

See journal articles listed under Materials Already Produced.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not Answered

PLANS FOR THE FUTURE:

1. Publish *Population Education--A Knowledge Base* in 1976.
2. Complete *Science, Technology, and Education in a Democratic Society* in 1977
3. Complete four related research studies in 1977.
4. Begin work on student population materials in 1977.
5. Begin another sourcebook in 1977.

COLLEGE SCIENCE IMPROVEMENT PROGRAM (COSIP)

Department of Physics and Earth Science
California State College
Bakersfield, California 93309
U.S.A.

Telephone: (805) 833-2220

Director: D. P. Detwiler

Project Duration: 1972-1974

Age: 18+
Ability: all
Subject: biol, chem, phys, earth-space, math
Language: English
Translations: none
Testing of Students: written achievement, oral and standardized tests; student attitude q're

Materials Developed by Project:

Print
- Activity Sheets
- Field Guides
- Eval. Materials
- Behavioral Objectives

Non-Print
- Slides
- Filmstrips
- Overhead Trans.
- Slide Tape
- Audiotape

Types of Learning Experiences:
- Lecture
- Seminar
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF: F. Fang, Co-Director; and Science Faculty

PROJECT HISTORY:

Principal Initiator(s): J. R. Coash, Dean, Natural Science and Mathematics.

Reason(s) for Project Initiation: Largely development of modular self-paced type instructional materials, both full courses and supplemental materials.

Evolution and Development of the Project:

1. Summer 1972 - Development of materials
2. 1972-1973 - Trial and some revision
3. Summer 1973 - Revision and additional development
4. 1973-1974 - Use
5. May 1974 - California State University and College representatives to reporting workshop

PROJECT OBJECTIVES:

Overall Project Purpose: To further develop the School of Natural Sciences and Mathematics inquiry-oriented instructional program on a school-wide basis.

Specific Objectives: To produce:

1. a curriculum permitting self-paced and individually tailored programs;
2. a redefinition of faculty role to resource person;
3. a set of alternative instructional and learning methods;
4. a curriculum reflecting and utilizing materials from latest course and curriculum projects; and
5. a program which might serve as a model for similar institutions, capable of implementation within budgetary limitations.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: State college population.

Ways in which it differs from similar or previous programs: School-wide effort to increase inquiry orientation and individualization of programs.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Module Study Guides, First Year Physics	Free Sample	COSIP
Slide-Tape, Various Chemistry Topics	Reproduction Charge	COSIP
Module Study Guides, Statistics Course	Free Sample	COSIP
Quasi-Modular Calculus Study Guides	Not Given	COSIP
Miscellaneous Supplementary Modules	Not Given	COSIP

COSIP (2)

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE:

Sample copies of: Module Study Guides, First Year Physics and Statistics Course.

ADDITIONAL MATERIALS BEING DEVELOPED:

Primarily continuing revision and some additional supplemental materials.

TEACHER PREPARATION: Not applicable

PROJECT EVALUATED:

Yes ____ No X Internal ____ External Agency ____

In-House or Unpublished Research: Student and faculty attitudinal studies; administration of standardized exam; standardized exams for some courses; and, Graduate Record Examination subject exams financed for seniors.

PROJECT PUBLICITY:

The Bakersfield Curriculum, F. T. Fang & J. R. Coash. *Journal of Chemical Education*. 50(1), 28, 1973.

Biochemistry--A Course for Everyone, M. J. Gilleland. *Journal of Chemical Education*. I, 23, 1975

COSIP Final Report, N.S.F. Grant No. GY9/00. D. P. Detwiler, 1974.

Inquiry Oriented Laboratory Instruction, F. T. Fang. *Journal of Chemical Education*. 52(1), 33, 1975.

Learning Modules in General Biochemistry, M. J. Gilleland. 168th A.C.S. Meeting Abstracts, Chemical Education Paper No. 32, 1974.

Physical Chemistry--An Individualized Instructional Approach, M. L. Dutton, 167th A.C.S. Meeting Abstracts, Chemical Education Paper no. 33, 1974.

Preparing the Creative Chemist, R. Dugger, *Change Magazine*. Vol. 8, No. 2, 18 1976.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Project terminated in 1974. Individual faculty have continued some further development and utilization.

PLANS FOR THE FUTURE:

Continuation of development and utilization.

COMMUNITY LEADERS TRAINING IN ENVIRONMENTAL STUDIES

426 Hull Drive
Florida State University
Tallahassee, Florida 32306
U.S.A.

Telephone: (904) 644-5769

Director: Rodney Allen

Project Duration: 1974-

Age: adult
Ability: all
Subject: biol, earth-space, soc. sci, envir. science
Language: English
Translations: none
Testing of Students: teacher judgments, student attitude questionnaire

Materials Developed by Project:

Print	Non-Print
Activity Sheets Tchr. Manuals	None

Types of Learning Experiences:

Seminar

PRINCIPAL PROFESSIONAL STAFF:

Rodney Allen, Director
David E. LaHart, Associate Director

PROJECT HISTORY:

Principal Initiator(s): D. E. LaHart, R. F. Allen

Reason(s) for Project Initiation: Need for adult leader training in use of Tallahassee Junior Museum facility and environmental studies.

Evolution and Development of the Project: The project evolved from the need for improved use of a community resource for environmental education of all age groups in Tallahassee (by the leaders of groups in all age categories). The project worked with leaders in small groups to develop innovative programs for the leaders' community groups. Programs were printed in booklets and 300 copies of each were distributed to leaders in similar groups. Project worked with 35 groups, the first year. The second year was devoted to retraining, dissemination, and work with new groups.

PROJECT OBJECTIVES: Not answered

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Adult community leaders.

Ways in which it differs from similar or previous programs: Serves North Florida area; focuses on a community education facility--the Tallahassee Junior Museum.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Ways to Environmental Education, Volume I	$6.58/Hard Cover $.76/Microfiche	ERIC Service
Ways to Environmental Education, Volume II	$6.58/Hard Cover $.76/Microfiche	ERIC Service
Ways to Environmental Education, Volume III	$6.58/Hard Cover $.76/Microfiche	ERIC Service
Ways to Environmental Education, Volume IV	$3.29/Hard Cover $.76/Microfiche	ERIC Service
Ways to Environmental Education, Final Report	$1.95/Hard Cover $.76/Microfiche	ERIC Service

PRESENT COMMERCIAL AFFILIATIONS:

ERIC Document Reproduction Service
Leasco Information Products, Inc.
P.O. Drawer O
Bethesda, Maryland 20014

COMMUNITY LEADERS TRAINING IN ENVIRONMENTAL STUDIES (2)

ADDITIONAL MATERIALS BEING DEVELOPED:

Environmental Action Guide
Final Report, 1975-1976

TEACHER PREPARATION:

Consultant Services: None needed

Pre-service and In-service Training: Free workshops for adults in our service area--held at the Tallahassee Junior Museum.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Pertinent Research Studies: none

In-House or Unpublished Research: None

Availability of Evaluative Data: None

PROJECT PUBLICITY:

Eco-Act--A Role Playing Game to Clarify Environmental Values, Primary Level. NAAHE Journal (National Association for the Advancement of Humane Education) Volume 2, No. 3 (Fall, 1975) University of Tulsa.

Eco-Act--A Role Playing Game to Clarify Environmental Values, Middle Grade Level. NAAHE Journal, Volume 2, No. 4 (Winter, 1975).

PLANS FOR THE FUTURE:

April, 1976, State Conference on Humanities and State Environmental Policy.
Two week summer workshop (1976) on Energy for High School Teachers.

COMPREHENSIVE SCHOOL MATHEMATICS PROGRAM (CSMP)

CEMREL-CSMP
3120 59th Street
St. Louis, Missouri 63139
U.S.A.

Telephone: (314) 781-2900

Director: Burt Kaufman

Project Duration: 1975-1978

Additional information, see also Clearinghouse Reports: 8,7 and the 20-Year Cumulative Directory for title change.

Age: 5-18, adult
Ability: all
Subject: math
Language: English
Translations: into German, Swedish, French and Spanish are planned
Testing of Students: written achievement and standardized tests; teacher judgments and independent classroom observations and review of materials

Materials Developed by Project:

Print
- Textbooks
- Supplementary Books
- Activity Sheets
- Tchr. Manuals
- Eval. Materials
- Overview
- Newsletters
- Coordinator's Handbook
- Tchr. Training Manual
- Answer Keys
- Brochures
- General Info.
- Occasional Papers
- Conference Reports

Non-Print
- Films
- Slide Tape
- Audiotape
- Games
- Manipulatives

Types of Learning Experiences:
- Discussion
- Independent Study
- Lab Activities
- Demonstrations
- Simulations

PRINCIPAL PROFESSIONAL STAFF:

Burt Kaufman, Director
Frederique Papy, Associate Director - Research and Development
Edward C. Martin, Editorial Coordinator
Paulette Kaufman, Production Coordinator
Peggy Powers, Assistant to Director
Martin Herbert, Associate Director - Evaluation
Knowles Dougherty, Evaluation Specialist
Lois Armetta, Production Manager
Production Specialists: Vivian Benson, Steven Simms, Linnard Pettit
Research and Development Specialists: Christiane Vandeputte, Kevin Saunders

PROJECT HISTORY:

Principal Initiator(s): Burt Kaufman

Evolution and Development of the Project: The project was originally called "The Nova Comprehensive Mathematics Project: (NCMP). In September, 1966, it became a curriculum development project sponsored by Southern Illinois University at Carbondale, and it was called "The SIU Comprehensive School Mathematics Project" (SIU-CSMP); in September, 1967, CEMREL made CSMP one of its major programs under a joint co-sponsorship with SIU, and the official name "Comprehensive School Mathematics Program" was adopted. In July, 1969, CEMREL assumed complete responsibility for CSMP's funding. (CEMREL is one of nine educational research and development laboratories established under the Cooperative Research Act and funded by the National Institute of Education.)

At present, fourth grade materials are being developed. K-3 materials already developed include: lesson plans for teachers, worksheets and workbooks for students, manipulatives, storybooks, supplementary materials for slow learners, and teacher training materials.

During the 1975-76 school year, 36 school systems, 758 teachers and 19,992 students used CSMP materials in 10 states and the District of Columbia. A program for highly verbal and well-motivated students (grades 7-12) is also being used by 48 teachers and 1,000 students in 11 states during the 1975-76 school year.

PROJECT OBJECTIVES:

Overall Project Purpose: The development of a K-12 mathematics curriculum to reflect the belief that the study of mathematics should be an interesting, challenging, intellectual and aesthetic experience for all students. The CSMP curriculum expects to truly engage the student in the study of mathematics. It expects to call upon his or her curiosity, intuition, powers of reasoning, imagination, perseverance, and organizational skills.

Specific Objectives:

CSMP Elementary Program - The content goals for the total K-6 program include development of the standard number systems (natural numbers, integers, rational numbers, decimals and real numbers) and their operations interwoven with a two-pronged development of geometry. On the one hand, a rich variety of experiences in combinatorical metric geometry are present throughout the program while, on the other hand, a carefully developed sequence of activities in affine (parrallelogram) geometry is presented which highlights the geometrical interpretations of the number systems on the line, provides deep insights into the geometry of the plane, and eventually, the linkages between the number systems and the Euclidean plane. On an equal footing with the above, the CSMP K-6 curriculum includes a strong component of probability, statistics and combinatorics. Computational skills are not slighted. Students using the program can be expected to demonstrate proficiency in the skills at least as high as those taking a more traditional program.

EM Program - The Elements of Mathematics Program, a 7th through 12th grade program, is designed to bring good, modern mathematics to highly verbal, well-motivated students who are in the upper 10-15% of the school population. Some of the goals of the EM Program are: 1) Students should be familiar with, and indeed, comfortable with, some of the basic ideas and techniques that are typical of mathematics. Similarly, they should be familiar and comfortable with some of the basic languages and notation of mathematics. 2) Students should be able to follow a mathematical argument; they should also have had experience in trying to invent and report such arguments themselves. 3) Students should have a familiarity with the axiomatic method in mathematics and have an appreciation of what this method does, and does not, provide. For example, students should be aware that a mathematical proof does not guarantee the "truth" of a given proposition, but does serve to show how this proposition is logically related to other propositions. 4) Students should have a familiarity with abstraction and its role in the development of a mathematical theory. They should be made aware of the power of apt abstractions as well as some of the ways in which mathematicians are led to such abstractions. 5) Students should have experience with nontrivial, relevant applications of mathematics; in particular, students should become familiar with the notion of model building and have the opportunity to develop mathematical models of "real" situations.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: CSMP is intended for students of all abilities in grades K-6, and currently, gifted students in grades 7-12.

Ways in which it differs from similar or previous programs:

CSMP Elementary Program - The program is based on a firm conviction that mathematics is a unified whole and should be learned as such. One of the results of this is our use of the spiral approach. CSMP content is sequenced in spiral form so that each student is brought into contact with each area of content continuously throughout the program. This approach consciously precludes atomizing the content and mastering each bit before continuing to the next. Rather, each student spirals through repeated exposures to the content, building interlocking experiences to ever increasing sophistication.

Another conviction is that no single method of classroom management suffices to meet the needs of every student. Hence, the program is constructed to allow numerous opportunities for whole class participation, small group participation, and independent individual study.

UNIQUE CHARACTERISTICS OF THE PROJECT: (Continued)

Ways in which it differs from similar or previous programs: (Continued)

The content is not presented as an artificial structure external to the child's experience and into which he is thrust, but rather as an extension of experiences the child has encountered in his development, both in real life and fantasy. The child is led through sequences of problem solving experiences presented in game-like as well as story settings. Powerful non-verbal languages enable children immediate access to the mathematical ideas and methods necessary not only for solving these problems but also for continually expanding their understanding of the mathematical concepts themselves.

1. The Language of Strings: This "language" mimics the basic method of organizing and collecting data relevant to problems at hand. That is, it deals with the fundamentally useful and important mathematical notion of set.
2. The Language of Arrows: This graphical "language" models the fundamental process involved in comparing and analyzing sets and operations on them. That is, it deals with the useful and important mathematical notions of relations and functions including, but not restricted to, permutations of sets, ordering relations and the numerical processes of adding to, subtracting from, multiplying by and sharing equally among.
3. The Language of the Papy Minicomputer: The Papy Minicomputer, an extremely effective abacus invented by Georges Papy, models the positional structure of our system of numeration and lends itself to very sophisticated algorithm processes, including the standard algorithms for the basic numerical operations.

EM Program - One aspect of the Elements of Mathematics Program is to explore the upper content limits of the mathematics that gifted students can understand and appreciate. Another innovative feature is that large sections of the program are not to be teacher-taught in the classical mode. The students read several of the books in the program on their own, with the teacher playing a new advisory and consultative role. Students can turn to the teacher for help in understanding what they are reading whenever they feel the need to do so.

It is the aim of the EM Program to familiarize the student with important mathematical problems, ideas, and theories that have at any time engaged the attention of serious mathematicians and serious users of mathematics. This differs from most high school math programs being taught today, because most programs deal exclusively with pre-eighteenth century mathematical ideas.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
A Partial list of the materials produced appears below. For more detail a list of all available materials is available from the project.		
The CSMP Elementary School Program: General		CSMP
Brochure describing the CSMP Elementary School Program	Free	
"Guidelines for the CSMP K-6 Curriculum in Probability, Statistics and Combinatorics"	$ .15	
"Guidelines for Graph Theory in the CSMP Elementary Program" by W. E. Deskins and Edward C. Martin.	1.50	
"The Papy Minicomputer: A Didactical Analysis" by Peter Braunfeld	1.00	
"Happy Twentieth Birthday, Minicomputer" by Georges Papy	.40	
"On Papy's Minicomputer" by Peter Braunfeld	.30	
"Halving" by Georges Papy	.30	
"The CSMP Elementary School Program" by Burt Kaufman and Nicholas Sterling	Free	
"An Introduction to the Mathematics of Grades K-2" A manual for teachers of the CSMP elementary curriculum, grades K-2	2.25	

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (Continued)

Material	Cost	Source
Stories by Frederique: The following stories by Frederique Papy are available. They are arranged according to the age of the intended audience. The stories are all intended just to be enjoyable reading. Some of them incidentally involve mathematical ideas; others do not. Each story captivates the reader by a simple story line that always is illustrated by means of mathematical languages such as those of dots, strings and arrows.	$ .35 each	CSMP

Age 5 to 8:
- 81 Roses
- I Am A Very Happy Boy
- One Out of Seven
- The Happy Puppet
- The Old Shoemaker
- Two By Two
- The Little Dreamer
- The Little Donkey
- The Magic Box
- The Baby is Born

Age 8 to 12:
- Where's My Nose?
- Singing Friends
- Dancing Friends
- The Living Lines
- I Am Not My Name
- Nabu Wins An Award
- The Square Trap

Age 10 to 14:
- The Hidden Treasure
- A Very Strange Neighborhood
- Election In The Number World
- A Valentine Mystery

Material	Cost	Source
Kindergarten Materials:		CSMP
Teacher's Guide for Kindergarten	$2.25	
Student Worksheets	1.40	
Demonstration Numeral Cards (1-30)	1.10	
Demonstration Dot Cards (1-30)	1.10	
K-A Blocks (cardboard pieces in various sizes, shapes and colors)	.30	
Number Line	1.25	
0-99 Numeral Chart	.30	
K Track Cards (includes 16 straight sections and 16 curved sections for making car tracks)	.50	
Demonstration Rod Kit	3.30	
Supplementary Reinforcing Activities for the CSMP First Grade Program	2.80	
Grade One Materials:		CSMP
Teacher's Guide--First Grade Lesson Plans (includes over 320 lesson plans and activities)	9.70	
Supplementary Reinforcing Activities for the CSMP First Grade Program	2.80	
Student Worksheets, to accompany Teacher's Guide (includes over 250 worksheets)	3.75	
Student Workbooks (67 seven-page books)	3.75	
Demonstration Minicomputer and Rod Kit (includes 4 magnetic Minicomputer boards, sets of magnetic checkers and rods, and 2 spinners)	11.50	
Addition Flash Cards	2.75	
Demonstration Numeral Cards (1-30)	1.10	
Demonstration Dot Cards (1-30)	1.10	
Number Line	1.25	
0-99 Number Chart	.30	
Tangram Set	.30	
A-Blocks (cardboard pieces in various sizes, shapes, colors and textures)	.40	
F-Blocks (shape blocks used for patterns)	.30	
Individual Minicomputer and Checkers	.35	
Individual Numeral Card Deck	.30	
Individual Dot Card Deck	.30	
Marble Shaker and Marbles	.30	

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (Continued)

Material	Cost	Source
Grade One Materials: (Continued)		CSMP
Dot Chart (10 by 10 array)	$ .30	
One-Way Road Maps	.65	
R16 Numeral Dot Deck	.30	
Minicomputer Cards	.30	
Assorted Posters (16 posters, featuring some of the CSMP story characters)	.75	
Mathematics for the Upper Primary Grades--Part I (Grade Two):		CSMP
Teacher's Guide (Volumes A, B, and C)	19.25	
Student Worksheets	2.75	
Student Workbooks	4.00	
Demonstration Minicomputer Kit	9.35	
Demonstration Translator	.50	
Demonstration Shapes for Geometry	.30	
Number Line	1.25	
Individual Minicomputer and Checkers	.35	
Marble Shakers and Marbles	.30	
One White Rod Ruler and One Orange Rod Ruler	.40	
Addition Flash Cards	2.75	
Subtraction Flash Cards	3.40	
Multiplication Flash Cards	2.55	
Rationals Flash Cards	.50	
A-Blocks	.40	
String Game Sheet	.15	
Minicomputer Super Flash Cards	.25	
Very Basic Facts Cards	.35	
Mathematics for the Upper Primary Grades--Part II (Grade Three):		CSMP
Teacher's Guide (Volumes D, E, and F)	25.00	
Student Worksheets	2.50	
Student Workbooks	3.00	
Demonstration Minicomputer Kit	9.35	
Demonstration Translator	.50	
Geometrical Figures for Part II	.30	
Number Line	1.25	
Road Map Package	.25	
Individual Minicomputer and Checkers	.35	
Marble Shakers and Marbles	.30	
One White Rod Ruler	.20	
A-Blocks	.40	
String Game Sheet	.15	
The CSMP Elements of Mathematics (EM) Program (A Mathematics Program for Gifted Secondary School Students)		CSMP
General Materials:		
Brief EM Description	Free	
"The Elements of Mathematics Program" This is a detailed description of the program for gifted secondary students.	$1.00	
"Outline of a Problem-Oriented, Computer-Oriented and Application-Oriented High School Mathematics Course" by Arthur Engel	.50	
"Objectives for 'A Short Course in Probability'" by L. Råde	.10	
"A Short Course in Probability" by Professor Arthur Engel. Ten lessons with exercises and answer key. Orders for this book should be sent to: Sharon Bocklage, CEMREL, Inc., 3120 59th Street, St. Louis Missouri, 63139.	Not Given	

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (Continued)

Material	Cost	Source
The CSMP Elements of Mathematics (EM) Program		CSMP
General Materials: (continued) (Five of the ten lessons with Professor Engel teaching a class of 7th graders at CSMP have been videotaped. For information as to the availability of filmed lessons, write to: Mr. Burt Kaufman, Director--CSMP; CEMREL, Inc. 3120 59th Street, St. Louis, Missouri 63139)	Not Given	
Textbooks: Many of these books are being used by specially prepared teachers in schools throughout the country. All books in the EM series have been copyrighted by CEMREL, Inc; they may not be reproduced or taught without the written permission of the CSMP Director. For further information on the EM program write to: Mr. Burt Kaufman, CSMP Director at the project address. A substantial discount is allowed on all classroom orders of ten or more. This discount may also be allowed on smaller orders at the discretion of CSMP. Prices are inclusive of postage, handling and packing materials.		CSMP
Book 0: Intuitive Background (Book 0 consists of 16 monographs, or chapters. All have been revised several times. The book may be purchased as a whole, or the chapters may be purchased individually according to the price schedule below. Neither the book price above nor the individual chapter prices below include teacher's manuals and answer keys. These are listed separately under each chapter title below. The special price of $15.00 is for the single examination copies only, not for classroom sets.	$15.00	
Chapter 1: Operational Systems	1.45	
Teacher's Manual & Answer Key	1.05	
Chapter 2: The Integers	.90	
Teacher's Manual & Answer Key	.75	
Chapter 3: Sets, Subsets, and Operations with Sets	1.10	
Teacher's Manual & Answer Key	.85	
Chapter 4: Ordered n-Tuples	.90	
Teacher's Manual & Answer Key	.80	
Chapter 5: Mappings	1.40	
Teacher's Manual & Answer Key	.95	
Chapter 6: The Rational Numbers	.95	
Teacher's Manual & Answer Key	.60	
Chapter 7: Decimals and an Application of the Rational Numbers	1.00	
Teacher's Manual & Answer Key	.70	
Chapter 8: Introduction to Probability	1.15	
Teacher's Manuals & Answer Key	.85	
Chapter 9: Introduction to Number Theory	1.00	
Teacher's Manual & Answer Key	1.40	
Chapter 10: Algebra in Operational Systems	2.50	
Teacher's Manual & Answer Key	2.35	
Chapter 11: Geometry: Incidence and Isometries	2.40	
Teacher's Manual & Answer Key	2.00	

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (Continued)

Material	Cost	Source
The CSMP Elements of Mathematics (EM) Program		CSMP
General Materials: (continued)		
Chapter 12: Topics in Probability and Statistics	$1.40	
Teacher's Manual & Answer Key	.75	
Chapter 13: Algebra of Real Functions	1.80	
Teacher's Manual & Answer Key	2.45	
Chapter 14: Geometry: Similitudes, Coordinates and Trigonometry	1.70	
Teacher's Manual & Answer Key	3.20	
Chapter 15: Topics in Number Theory	.95	
Teacher's Manual & Answer Key	1.45	
Chapter 16: Introduction to Computer Programming	1.80	
Teacher's Manual & Answer Key	1.70	
Book 1: Introductory Logic	1.70	
Teacher's Manual & Answer Key	1.35	
Book 2: Logic and Sets	2.25	
Teacher's Manual & Answer Key	1.40	
Book 3: Introduction to Fields	3.80	
Teacher's Manual & Answer Key	3.20	
Book 4: Relations	2.00	
Teacher's Manual & Answer Key	3.20	
Book 5: Functions	3.15	
Teacher's Manual & Answer Key	3.50	
Book 6: Number Systems	3.10	
Teacher's Manual & Answer Key	3.15	
Book 7: Real Analysis: Calculus of One Variable	5.10	
Book 8: Elements of Geometry	2.00	
Teacher's Manual & Answer Key	1.20	
Book 9: Linear Algebra and Geometry with Trigonometry	3.95	
Teacher's Manual & Answer Key	4.00	
Book 10: Groups and Rings	2.85	
Teacher's Manual & Answer Key	2.95	
Book 11: Finite Probability Spaces	2.70	
Teacher's Manual & Answer Key	2.90	
Book 12: Introduction to Measure Theory	1.75	
Book A: An Introduction to Mathematization: A Theory of Voting Bodies (This Book is supplemental to Book 0)	1.45	
Teacher's Manual & Answer Key	.75	
Book B: EM Problem Book with Key	2.10	

PRESENT COMMERCIAL AFFILIATIONS:

CEMREL, Inc.
3120 59th Street
St. Louis, Missouri 63139

MATERIALS AVAILABLE FREE: See materials listed under Materials Already Produced

ADDITIONAL MATERIALS BEING DEVELOPED:

Curriculum materials for grades 4, 5 and 6 are being developed between December, 1975 and August, 1980. These materials will include lesson plans for teachers, worksheets and workbooks for students, manipulatives, storybooks, supplementary materials for slow learners, and teacher training materials.

TEACHER PREPARATION:

Consultant Services: Each school system participating in CSMP designates a local coordinator who 1) attends summer training workshops, 2) conducts CSMP training workshops for teachers new to the program before school begins in accordance with minimum hour requirements (K-8 hrs., 1st grade-16 hrs., 2nd grade-24 hrs., 3rd grade-24 hrs., 4th grade 32 hrs.), and 3) serves as a major liaison between the school system's administrators, teachers, parents, and pupils and CEMREL-CSMP. Additional consultant services may be rendered by CEMREL-CSMP during the year upon request.

Pre-service and In-service Training: Each summer, CEMREL-CSMP conducts training workshops for coordinators, both new and veteran. In the workshops, coordinators are exposed to the philosophy, content and pedagogy of CSMP. From these workshops, coordinators gain the knowledge necessary to conduct similar workshops in their area for teachers of CSMP.

CEMREL-CSMP does not charge a fee for training coordinators (or teachers). Expenses incurred in attending the workshops, such as travel, lodging and meals, are borne by the coordinators or their school systems.

Pre-service and In-service Teaching Materials: Coordinators, or their school systems, purchase a Coordinator's Kit for use in training teachers and coordinating the program during the academic year. These Kits are as follows:

Coordinator's K-1 Set ($43.00)
Coordinator's Second Grade Set ($33.00)
Coordinator's Third Grade Set ($30.00)

Start-up costs for the program include the above mentioned training plus purchase of appropriate grade level materials. Costs of the materials are:

Kindergarten ($53.15)
First Grade ($197.25)
Second Grade ($143.00)
Third Grade ($150.35)

Start-up costs are substantially higher than costs for subsequent years. Costs for consumable materials which need to be replaced the second year follow:

Second Year: Kindergarten ($32.50)
First Grade ($130.45)
Second Grade ($76.65)
Third Grade ($69.30)

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Pertinent Research Studies: Longitudinal Extended Pilot Study of the CSMP Elementary School Program (Evaluation Report Series available from the project).

Availability of Evaluative Data: Only Evaluation Report Series noted above.

PROJECT PUBLICITY:

Bibliography of Published Articles from Professional Journals or Magazines:

"The Role of Algebra in a Modern K-12 Curriculum" by Peter Braunfeld (A reprint from the International Journal of Science and Technology, Vol. 4, 1973.)

PROJECT PUBLICITY: (Continued)

"Nebuchadnezzar, Seller of Newspapers: An Introduction to some Applied Mathematics" by Frederique Papy (A reprint from The Arithmetic Teacher, April, 1974.

"What Behaviourism Has Done for American Education" by Edward C. Martin (A reprint from Mathematics Teaching, Fall, 1973.)

"A Response to Managerial Education," a Special Issue of Educational Technology, November, 1973, co-edited by Burt Kaufman and Gerald R. Rising.

"Numerical Calculation in a Modern Teaching of Mathematics at the Elementary School Level" by Frederique Papy (Originally printed in New York State Mathematics Teachers Journal, January, 1974.)

"Relations and Probability" by Burt Kaufman and Lennart Rade (An offprint of an article published originally in Educational Studies in Mathematics, Vol. 5, 1973.)

"Mathematical Education--A Viewpoint" by Peter Braunfeld and Burt Kaufman (A reprint from International Journal of Mathematical Education in Science and Technology, Vol. 3, 1972.)

"New Math or Old Math? The Wrong Question" by Burt Kaufman and Vincent Haag (To be published in the near future in The Arithmetic Teacher. Already published in F & M Today, the alumni magazine of Franklin and Marshall College, Vol. III, No. 5, 1974.)

"Basic Mathematical Skills & Learning: The CSMP Viewpoint" by Burt Kaufman, Vincent Haag, Nicholas Sterling, and Frederique Papy (To be published in the proceedings of the NIE Conference on Basic Mathematical Skills held in Euclid, Ohio, October, 1975.)

PROJECT ACTIVITIES SINCE 1974 REPORT:

1. CSMP is operating under a three-year contract (December, 1975 through August, 1978) with a two-year renewal clause from the National Institute of Education.

2. Membership of the National Advisory Committee has changed since 1974. Current members include:

   Professor Peter Hilton,
   Battelle Seattle Research Center, and
   Case-Western Reserve, and
   Forschungsinstitut fur Mathematik, Zurich, Switzerland

   Professor Clarence E. Hardgrove
   Northern Illinois University

   Dean Curtis F. Jefferson
   Cuyahoga Community College

   Professor Gerald R. Rising
   State University of New York at Buffalo

   Professor Ernest R. House
   University of Illinois at Urbana-Champaign

   Professor Shirley Hill
   University of Missouri - Kansas City

3. CSMP staff associates spend time at CEMREL individually developing curriculum and teaching demonstration classes. Staff associates no longer meet as a group every four months, but spend extended time in residence at CSMP during semester breaks and in the summer months. CSMP staff associates are:

   Professor Peter Braunfeld
   University of Illinois at Urbana-Champaign

PROJECT ACTIVITIES SINCE 1974 REPORT: (Continued)

Professor W. E. Deskins
University of Pittsburgh

Professor Robert Exner
Syracuse University

Professor Vincent Haag
Franklin and Marshall College

Professor Georges Papy
University of Brussels and Belgian Center for the Pedagogy of Mathematics

Professor Lennart Rade
Chalmers Institute of Technology
Gotenborg, Sweden

Professor Hans-Georg Steiner
Universitat Bielefeld
West Germany

Professor Nicholas Sterling, Jr.
State University of New York at Binghamton

Professor Robert Troyer
Lake Forest College

4. Frederique Papy, former special consultant, has become a fulltime member of the staff in the position of Associate Director - Research and Development.

5. Pilot tests of Kindergarten materials are completed and final revision for publication will be completed this summer. First grade materials have been pilot tested for two years and Supplementary Reinforcing Materials for first grade are being tried and will be incorporated into the materials in the final revision which will take place during 1976-77. Second grade materials are undergoing their second year of extended pilot testing and will undergo final revision during 1976-77. Third grade materials are undergoing their first extended pilot testing, which will be complete at the end of this 1975-76 academic year. Writing and experimental teaching of fourth grade entry materials and first semester fourth grade (for veteran CSMP students) materials are taking place during the current academic year.

6. A dissemination plan for CSMP materials is being developed and an information program to publicize the program is being conducted. An overview booklet on CSMP was mailed in February, 1976, to approximately 75,000 elementary schools in the United States. CSMP expects the number of extended pilot test sites to double or triple during 1976-77 as a result of this mailing and advertising in various professional journals.

7. The number of school systems, teachers and students using CSMP has grown to: 36 school systems, 758 teachers, 19,992 students in 10 states and the District of Columbia.

8. Local coordinators for CSMP are trained at CEMREL-CSMP workshops during the summer months. Five such workshops are planned for Summer, 1976.

PLANS FOR THE FUTURE:

Between Summer 1976 and the Fall of 1978, CSMP plans to accomplish the following:

1. Grade One: make final revisions and print the revised version.
2. Grade Two: complete the second extended pilot test, make final revisions and print the revised version.
3. Grade Three: conduct second extended pilot test, make final revisions and print the revised version.

PLANS FOR THE FUTURE: (Continued)

4. Grade Four: complete writing and experimental teaching and produce a first draft of fourth grade materials which will go through a local pilot test and a first extended pilot test.
5. Grade Five: do the writing and experimental teaching and produce a first draft of fifth grade materials.
6. Grade Six: do writing and experimental teaching of sixth grade materials through the first semester of sixth grade.
7. Additionally, two entry level programs will be developed, one each for the fourth and fifth grades.
8. The completion of the K-6 program will occur during the two-year addendum period to our present contract October 1978-September 1980 .
9. CSMP proposes to locate a publisher and arrange for commercial publishing of the entire CSMP Elementary Program upon completion of development, testing and final revision.

COMPUTER INTEGRATION IN THE MATHEMATICS CLASSROOM

Sylvania South High School
5403 Silica Drive
Sylvania, Ohio 43560
U.S.A.
Telephone: (419) 882-0555, EXT. 249

Director: Ralph Barry

Project Duration: 1974-1976

Age: 15-17
Ability: average, above average
Subject: math
Language: English
Translations: none
Testing of Students: written achievement tests, standardized tests, student attitude q're

Materials Developed by Project:

Print	Non-Print
Activity Sheets	
Tchr. Manuals	
Eval. Materials	

Types of Learning Experiences:
Lecture
Lab Activities

PRINCIPAL PROFESSIONAL STAFF:

Louis Korb, Project Assistant
Roberta Hudson, Project Assistant

PROJECT HISTORY:

Principal Initiator(s): Ralph Barry
Lewis Whitman
Roberta Hudson
Louis Korb

Reason(s) for Project Initiation: To improve mathematics understanding of high school students by integrating the use of machine language micro-computers into the normal mathematics curriculum.

Evolution and Development of the Project:

1. Summer, Semester 1 - 1974/75 -- Inservice training in equipment use/curriculum development.
2. Semester 2 - 1974/75 -- Pilot project with Algebra I, Algebra II students.
3. Summer 1975 -- Review; development of new materials; revision.
4. 1975/76 -- Expansion to full year of Algebra I, Algebra II and topics in Trigonometry and Senior Math.

PROJECT OBJECTIVES:

Overall Project Purpose:

To improve understanding and problem-solving ability in mathematics students through the use of micro-computers.
To improve the attitude of students towards mathematics.
To develop curriculum units incorporating the micro-computer into the regular mathematics program.

Specific Objectives:

1. To demonstrate significant growth in ability to analyze problems and use logical sequence in mathematical problem-solving.
2. To demonstrate significant growth in ability to recognize and use the behavior of functions.
3. To demonstrate significant growth in familiarity with computer programming concepts.
4. To demonstrate significant growth in achievement on standardized high school algebra tests.
5. To demonstrate significant growth in attitudes toward mathematics.

COMPUTER INTEGRATION IN THE MATHEMATICS CLASSROOM (2)

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: The students involved in this project are average to above average students, grade 10-12, in a suburban community. The socio-economic group is generally upper-middle although all levels are represented. Parents are generally well read, professional people.

Ways in which it differs from similar or previous programs: This program incorporates the use of machine language micro-computers into the regular course work in Algebra I and Algebra II and in Trigonometry, Probability, and Calculus. Students are asked to write and/or run programs illustrating mathematical concepts.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

A one year course in Algebra I including an introduction to machine language, micro-computer programming, flowcharting, a student manual, and proposed daily teaching schedule, assignments, objectives, student activities, and projects incorporating the use of micro-computers into the regular course work.

A one year course in Algebra II including an introduction to machine language, micro-computer programming, flowcharting, a student manual and proposed daily teaching schedule, assignments, objectives, student activities and projects incorporating micro-computer use into the regular course work.

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

One year course in Calculus and Analytic Geometry.
One semester course in Trigonometry.
One semester course in Probability and Statistics.

TEACHER PREPARATION:

Consultant Services: Contact Mr. Falcone, Educational Advisor, Olivetti Corporation, New York.

Pre-Service and In-service Training: None

Pre-service and In-service Teaching Materials: Programmed Instruction 101 Programing available through Olivetti Corp. $3.50.

PROJECT EVALUATED:

Yes X No ______ Internal ______ External Agency X

Name of Outside Evaluators: Bowling Green State University

In-House or Unpublished Research: This project is being evaluated on the basis of Pretest/Posttest of each objective. Final evaluation will be availabe in June, 1976.

Availability of Evaluative Data: Final evaluation will be available June, 1976. Synopsis can be provided through Sylvania High School.

PROJECT PUBLICITY: None

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE:

The project is terminating in June, 1976. At that time, in light of final evaluation, materials will be reviewed, and those which prove to be valuable will be retained in the mathematics curriculum.

CONSERVATION AND ENVIRONMENTAL STUDIES, INC. (CESC, INC.)

Box 2230 R.D. 7
Browns Mills, New Jersey 08015
U.S.A.

Telephone: (609) 893-9151

Director: V. Eugene Vivian

Project Duration: 1966 -

Age: 5-18
Ability: all
Subject: environmental studies
Language: English
Translations: none
Testing of Students: teacher judgments

Materials Developed by Project:

Print	Non-Print
Activity Sheets	None
Tchr. Manuals	
Field Guides	
Behavioral Objectives	

Types of Learning Experiences:

- Discussion
- Independent Study
- Lab Activities
- Field Experiences

PRINCIPAL PROFESSIONAL STAFF:

Dr. V. Eugene Vivian, Executive Director
William D. Michalsky, Assistant Director
George Henkel, Environmental Consultant
Thomas H. Griffin, Environmental Consultant
Richard P. Adamiak, Environmental Planner

PROJECT HISTORY:

Principal Initiator(s): V. Eugene Vivian

Reason(s) for Project Initiation: Need for improvement in environmental quality, first hand learning experiences, teacher training, and curriculum materials.

Evolution and Development of the Project:

1. ESEA Title III Planning Grant 1966-1968
2. ESEA Title III Grants 1968-1971
3. Organization of non-profit corporation 1970
4. Continuance of project by funds from fee bearing contracts or special grants.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop K-12 program in environmental studies and assist implementation.

Specific Objectives:

1. To develop K-12 curriculum materials as teacher guides;
2. To provide teacher training courses; and
3. To conduct student classes continuously.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Broad population Kindergarten through Community College.

Ways in which it differs from similar or previous programs:

1. Continuous communication with more than 200 districts in New Jersey plus six colleges (they provide CESC's fiscal support).
2. CESC curriculum materials sold in all states, Canada and some western European countries. CESC distributes its own catalogue of its own commercially published and self-published curriculum materials.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Sourcebook for Environmental Education	$5.95	CESC
Ecology For Children (Five different learning packets of teacher's booklets and children's spirit masters on air, water, land, plants and animals)	$3.95/book 4.95/masters	CESC CESC

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (Continued)

Material	Cost	Source
Special Environmental Education Teacher Guides:		CESC
Exploitation of the Pine Barrens	$2.50	
Guidebook for Resident Environmental Education Programs	5.00	
Laboratory Experiences in Marine Biology Teacher Edition & Student Edition	$3.50 each	
Marine Science Sourcebook	3.50	
Teacher's Handbook for Resident Environmental Education Programs	5.00	
Overpopulation	3.00	
Air Quality Manual	5.00	
Biological Aspects of Water Quality Monitoring	3.00	
Metric Measurements in Your Own Environment (Thirty-Six Task Cards)	12.95	DPR Publishers
Environmental Education Instruction Plans:	3.00 each	CESC
Angling for an Unknown Dimension (Mathematics)		
Art and Design in the Environment		
Cemetery Study		
Founding a New Settlement		
Inviting Involvement in History		
Is There A Better Way? - with Conservation Posters		
North, South, East, West - Map and Compass Study		
Physical Study of a Jetty		
Water - The Waste of Plenty		
Succession Studies		
Litter and Solid Waste Disposal		
Environmental Resource Inventories: Complete Reports with Maps as Published		CESC
Bass River Twp., New Jersey	$5.00	
Bulltown & Friendship	3.00	
Oswego River Extension and the Plains	3.00	
CESC Supplementary Curriculum Materials:		CESC
Blueberry Queen	.25	
CESC - Impact!	.15	
Definition of Environmental Education	.15	
Here's What You Can Do About Air Pollution	.20	
Jersey Devil	.50	
Quadrat Study Guide	.30	
What You Can Do To Improve Your Environment	.50	
A Deserted Farm Trip	.30	
Dirty Air Definitions	.15	
Ecology - An Overview	.15	
Exploring A Deserted Historic Site	.25	
Exploring Old Cemeteries	.25	
Operation Nightwatch	.30	
Star Guide Study	.25	
Study of a Rotting Log	.25	
Stump Scouting	.25	
Tips for Field Trips	.15	
Multidisciplinary Environmental Education Packages How to combine units from more than one subject area in a unified approach. May be used as part of a resident program or based entirely in the classroom.	4.00	

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (Continued)

Material	Cost	Source
Water Quality Study Materials:		CESC
Water Quality Lab	$150.00	
Biological Effects of Fluctuating Water Levels - Fresh Water - (secondary)	2.00	
Biological Effects of Tidal Fluctuations of Bays and Estuaries - (secondary)	2.00	
Capacity of a Watershed - (intermediate-secondary)	2.00	
Detecting Biological Pollutants in Fresh Water - (secondary)	2.00	
Pond Life - (intermediate)	2.00	
Water Quality Study - Physical and Chemical - (intermediate and secondary)	2.00	
What's In a Pond? - (primary)	2.00	
Life in Fresh Water Wetlands - (intermediate)	2.00	
K-12 Curriculum In Environmental Education	$2.00 each	CESC

(Each lesson has a "Mini-Curriculum" including generalizations, objectives, outline of preliminary and follow-up classroom activities and a student worksheet(s).)

Primary Level
- The Blueberry Bush
- Life in a Company Town
- Signs of Animals
- What's In A Pond
- Where Do Cranberries Gorw
- Exploring A Forgotten Site
- Forest Fires
- Pollution Trails
- What's Alive
- What's In Sand
- Where Do Seeds Come From
- Nature's Colors
- Sense Impressions: Framing the Natural World
- Textures in Nature
- Counting In Your Environment
- Using the Thermometer in Your Environment

Upper Elementary, Intermediate, Junior High
- Air Quality--How to test for pollutants
- Animal Ecology
- Birds and Pesticides: The Ecological Imbalance
- The Blueberry Industry
- The Cranberry Industry
- Ecology of Fresh Water Wetlands
- Effect of Fire in the Pinelands
- Exploring a Forgotten Site
- Insects in the Web of Life
- Life in A Company Town
- Monitoring Along Pollution Trails
- Plant Ecology
- Plants: Practical, Pest or Poison?
- Pond Ecology
- Soil and Geological Forces: Man's Ecological Base
- The Ecological and Hydrological Study of a Watershed
- Water Quality: How to test for Pollutants
- Worlds in Miniature: Study of Microclimates
- Environmental Awareness: A Key To Communication Skills
- Reading the Environment With Map and Compass
- Adventures with Environmental Measurement
- Environmental Volumes and Weights

CESC (4)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (Continued)

Material	Cost	Source
K-12 Curriculum In Environmental Education (continued)	$2.00 each	CESC

Secondary
Air Quality Monitoring
Biological Effects of Tidal Fluctuations of Bays and Estuaries
Detecting Biological Pollutants in Fresh Water
Exploration of an Abandoned Historic Stie
Field Problems--Raising Questions and Seeking Answers
Plant Communities in the Pine Barrens or Other Selected Areas
Quadrat Study--An Ecological and Population Survey
Watersheds: Ecological and Hydrological Dynamics
Succession - Change in Biological Communities
Transects - An Ecological Cross-Section of An Area
Water Quality - Probing for Pollution and Potability

PRESENT COMMERCIAL AFFILIATIONS:

Mosby-Times Mirror
11830 Westline Industrial Drive
St. Louis, Missouri 63141

DPR Publishers, Inc.
Northwest Blvd.
Newfield, New Jersey 08344

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

None at the present time; awaiting a development grant. Expect to prepare an energy education curriculum in connection with ESEA III for Manasquan, New Jersey School District.

TEACHER PREPARATION:

Consultant Services: Our consultants visit a school or regional group of teachers to conduct training sessions at a cost of $110 per day or $55.00 per half day.

PROJECT EVALUATED:

Yes X No ____ Internal ____ External Agency ____

Pertinent Research Studies: None

In-House or Unpublished Research: None

Availability of Evaluative Data: Visitors to center may see our participants' evaluations.

PROJECT PUBLICITY:

Science Teacher, 1970
Science and Children, 1971
Instructor, January 1971
Teacher, 1972
Review of Publication, Science Teacher, 1974

PROJECT ACTIVITIES SINCE 1974 REPORT:

Implemented two National Science Foundation Teacher Training Grants:
1974-1975 - Environmental Studies for Urban Children (ES)
1975-1976 - Outdoor Biology Instructional Strategies (OBIS)

PLANS FOR THE FUTURE: See Additional Materials Being Developed.

CURRICULUM MODIFICATION THROUGH ENVIRONMENTAL STUDIES

Environmental Studies Center
2900 N.E. Indian River Drive
Jensen Beach, Florida 33457
U.S.A.

Telephone: (305) 334-1262

Director: Jay Jarrett

Project Duration: 1972-

Age: 5-14
Ability: all
Subject: envir. ed
Language: English
Translations: none
Testing of Students:
written achievement tests

Materials Developed by Project:

Print
- Programmed Units
- Activity Sheets
- Tchr. Manuals
- Field Guides
- Eval. Materials
- Behavioral Objectives
- Overview of Project
- Newsletters
- Charts
- Games
- Puzzles
- Flash Cards

Non-Print
- Slides
- Slide Tape
- Games

Types of Learning Experiences:
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Demonstrations
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

Frank H. Pittman, Curriculum Coordinator; Ruth Anderson, Olive Ashby, Dennis Clark, Ella Clark, John Whiticar, Staff instructors.

PROJECT HISTORY:

Principal Initiator(s): Olive Ashby, Ella Clark, Martin County School Board

Reason(s) for Project Initiation: Lack of science education in elementary grades and need for environmental education in face of rapid development.

Evolution and Development of the Project: Funded 3 years under ESEA Title III; developmental phase completed May 1975; validated by Joint Dissemination Review Panel, Office of Education, Dec. 1975; entered undetermined period of dissemination/diffusion July 1, 1975. Operational program taken over and continued by Martin County School Board July 1, 1975.

PROJECT OBJECTIVES:

Overall Project Purpose: Developmental period mission objective - "To develop and evaluate...a field-oriented sequential program of environmental study for all students K-8 enrolled in Martin & Okeechobee Counties which will result in specified levels of cognitive gain...The costs and logistics associated with the operation of this project will be such that the resultant program can be accommodated into the curricula of the participating schools with existing human and materials resources."

Specific Objectives: A total of 37 specific objectives are set forth for the nine grades served. All are cognitive in content.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Project served all levels in grades K-8; socio-economic from migrant farm family to ultra-affluent; Caucasian, Black, Spanish Surname, Indian and Oriental.

Ways in which it differs from similar or previous programs: Differs primarily in sequential nature and comprehensiveness of treatment. Developed for and tested by the total school population of two counties - public and private schools alike. Materials developed are unique in their content in that they are developed for the specific locale; yet structure and conduct of the program is adaptable to any other locale through substitution of local sites, species and environmental problems.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Brochure describing program	Free	Curr. Mod. through Environmental Stud.
Color brochure offering services	Free	
JDRP report reprint (validating instrument)	Free	
Booklet with secondary information (brochure follow-up)	Free	
Teacher packages for K through 8 (includes instructions, copy of all student materials, tests and answer keys.	$0.75-$3.00	
Slide-tape instructional units for above grades	$5.00-$20.00	
Dune Plants - plant identification booklet	$ 0.50	
Architects of the dune - slide-tape program on beach dune plants	$25.00	
"Eat and Be Eaten" - food chain card game - elementary level	$ 5.00	

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: See Materials Already Produced, Including Sources and Costs

ADDITIONAL MATERIALS BEING DEVELOPED:

Slide/tape programs on: Sea Turtles, Nuclear Power Plant and Bees.
Training materials for adopting teachers.
Adaptions of marine programs to fresh water and terrestrial ecosystems.

TEACHER PREPARATION:

Consultant Services: On-our-site training in use of materials and conduction of field programs, assistance in adapting materials to another site, evaluation assistance and impact assessment, workshops on sites other than ours can be arranged.

Pre-service and In-service Training: Delivery of teacher packages for grade(s) specified - at printing cost, hands-on training with actual field experience and students. No cost other than one set of materials (from 75¢ to $3.00) and normal living expenses while at our site. Free camping space available to observers or trainees.

Pre-service and In-service Teaching Materials: In preparation.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency X

Name of Outside Evaluators: Joint Dissemination Review Panel

Pertinent Research Studies: None beyond the validation instrument.

In-House or Unpublished Research: None available other than validation instrument.

PROJECT EVALUATED: (continued)

Availability of Evaluative Data: By specific written request or personal visit by arrangement.

PROJECT PUBLICITY:

"No Overcrowding in This Classroom," Florida Schools, Dec. 1974.

PROJECT ACTIVITIES SINCE 1974 REPORT:

All materials have been reworked, re-packaged and printed for dissemination. Project was validated in 1975 by professional team from North Carolina Dept. of Public Instruction.

PLANS FOR THE FUTURE:

Continued operation of demonstration center for Martin County Schools. Series of regional workshops around Florida starting April, 1976 and continuing bi-monthly while requests last. Adaptation of marine field trips to fresh water and terrestrial areas, summer of 1976 and continuing as time is available. Completion of projected slide-tape programs in 1976.

DEVELOPING MATHEMATICAL PROCESSES (DMP)

Wisconsin Research & Development Center
1025 W. Johnson Street
Madison, Wisconsin 53706
U.S.A.

Telephone: (608) 263-4284

Director: Thomas A. Romberg, John G. Harvey, James M. Moser, Mary E. Montgomery

Project Duration: 1967-

Additional information, see also Clearinghouse Reports: 9 and the 20-Year Cumulative Directory for title change.

Age: 5-11
Ability: all
Subject: math
Language: English
Translation: Spanish
Testing of Students:
written achievement tests, lab performance tests, oral tests, teacher judgments

Materials Developed by Project:

Print
- Textbooks
- Lab Books
- Activity Sheets
- Tchr. Manuals
- Eval. Materials
- Behavioral Objectives
- Overview
- Newsletters

Non-Print
- Games
- Lab Equipment
- Filmstrips
- Films
- Slide Tapes

Types of Learning Experiences:
- Lecture
- Discussion
- Independent Study
- Seminar
- Lab Activities
- Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Thomas A. Romberg, Principal Investigator
John G. Harvey, Principal Investigator
James M. Moser, Project Coordinator
Mary E. Montgomery, School Coordinator
Vicky Kouba, Writer
Gwennyth Trice, Writer
Diana Wearne, Testing Specialist
Donald Whitaker, Assistant School Coordinator

PROJECT HISTORY:

Principal Initiator(s): Thomas A. Romberg
Harold Fletcher

Reason(s) for Project Initiation: Update methodology, change in philosophy.

Evolution and Development of the Project:

1967-68: Problem defined; needs, constraints, capabilities assessed; goals set.
1968-73: Task analyses made to identify mathematical objectives; instructional procedures decided upon to meet objectives.
1968-76: Pilot materials developed, tried in schools, and results analyzed.
1972-76: Pilot materials were revised, field tested, and the results analyzed.

PROJECT OBJECTIVES:

Overall Project Purpose: The goals of DMP are: (1) to foster more careful attention to the learning progress and problems of the individual child; (2) to develop more favorable teacher and student attitudes toward mathematics, thereby generating a more wholesome school and class atmosphere; (3) to help children become inquiring, independent problem solvers; and (4) to enable children to acquire and demonstrate competency in the arithmetic of rational numbers, the geometry of physical time-space, and the fundamentals of statistics.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Though DMP is designed for use in an individualized setting, it can be used effectively by teachers with students of varying abilities in a variety of school settings. The DMP large scale field test has included suburban, urban-core, and non-urban schools with both public and private schools participating. The program has been used with children of differing-socio-economic backgrounds, with children in special education classes and with

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: (continued)

children on American Indian reservations. A special Spanish version of the student materials is available from the publisher.

Ways in which it differs from similar or previous programs: Developing Mathematical Processes (DMP) is a research-based, elementary mathematics program. It provides a complete mathematics program for the elementary school, including not only the usual topics of arithmetic, but also an informal, intuitive introduction to major ideas of geometry and statistics. DMP is based upon the assumption that children learn best in an active environment where they can seek out answers to problems of personal interest. The project uses a measurement approach where children examine objects in their world and focus on some attribute (length, numerousness, weight, capacity, area, time, etc.). They use various processes (describing, classifying, comparing, ordering, equalizing, joining, separating, grouping and partitioning) to explore relationships between objects. Once children are familiar with the attributes, they symbolically represent (measure) them. Likewise, they symbolically represent the relationships between objects with mathematical sentences. Then the children represent mathematical sentences with real objects to check their validity.

Closely related specific learning objectives and the activities designed to promote their attainment have been clustered to form approximately 90 topics, each of which contains appropriate teacher's guides, student booklets, textbooks (for intermediate levels), testing materials and kits of physical materials and printed materials. The topics have been grouped into units for purposes of organizing materials and to facilitate a continuous progress design, and into levels that approximate one school year of study. The Primary Materials include Topics 1-40, the Lower Intermediate Materials include Topics 41-65, and the Upper Intermediate Materials include Topics 66-90.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material		Cost	Source
Level K- Topics 1-14	Complete Kit	$226.00	Rand McNally
	Includes the following components:		
	Physical Materials Kit A	96.00	
	Printed Materials Kit	57.00	
	Teaching Materials Kit	25.20	
	Student Materials Kit (consumable)	53.58	
Level 1- Topics 15-27	Complete Kit	$410.00	
	Includes the following components:		
	Physical Materials Kit A	96.00	
	Physical Materials Kit B	137.00	
	Printed Materials Kit	57.00	
	Teacher Materials Kit	31.50	
	Student Materials Kit (consumable)	94.50	
Level 2- Topics 28-40	Complete Kit	446.00	
	Includes the following components:		
	Physical Materials Kit A	96.00	
	Physical Materials Kit C	158.00	
	Printed Materials Kit	57.00	
	Teacher Materials Kit	31.50	
	Student Materials Kit (consumable)	110.25	
Level 3- Topics 41-52	Complete Kit	525.00	
	Includes the following components		
	Physical Materials Kit	210.00	
	Printed Materials Kit	57.00	
	Teacher Materials Kit	31.50	

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material		Cost	Source
	Student Materials Kit (consumable)	$ 94.50	Rand McNally
	Student Guide Kit (nonconsumable)	138.60	
Level 4-	Complete Kit	478.00	
Topics 53-65	Includes the following components:		
	Physical Materials Kit	164.00	
	Printed Materials Kit	57.00	
	Teacher Materials Kit	31.50	
	Student Materials Kit (consumable)	94.50	
	Student Guide Kit (nonconsumable)	138.60	
	Complete kits contain all materials for teacher and 32 students. Levels 5 and 6 will be available for fall, 1976.		
DMP Overview Film		96.00	
Filmstrip on DMP Materials		15.00	
Demonstration Kit of DMP Materials		100.00	

PRESENT COMMERCIAL AFFILIATIONS:

Rand McNally and Company
School Department
P. O. Box 7600
Chicago, Illinois 60680

MATERIALS AVAILABLE FREE:

DMP Project reports are available in limited quantity from Wisconsin R & D Center.

Brochures describing DMP materials are available from Rand McNally.

ADDITIONAL MATERIALS BEING DEVELOPED:

Skill and Concept Maintenance Kits
Terminal Accountability Tests

TEACHER PREPARATION:

Consultant Services: Since 1972 several hundred DMP Coordinators have been trained jointly by the Wisconsin R & D Center and Rand McNally to assist local school districts with the implementation of the DMP program. A list of these coordinators is available from Rand McNally and Company.

Pre-service and In-service Training: The DMP Coordinators are available to assist with teacher inservice training. In addition, a group of specially trained college mathematics educators (called DMP Leadership Specialists) is available to assist with both preservice and inservice training of teachers.

Pre-service and In-service Teaching Materials: A copy of the DMP Resource Manua is provided in each kit of teacher materials. This Resource Manual provides a framework around which to organize a complete inservice or preservice program.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Pertinent Research Studies:

All studies listed below are technical reports published by the Wisconsin Research and Development Center, Madison, Wisconsin 53706. Most are also published in various scholarly journals.

PROJECT EVALUATED:

Pertinent Research Studies: (continued)

No. 140 Stewart, D. M. Development of a group test of arithmetic achievement for Developing Mathematical Processes, Arithmetic Book I, 1970.

No. 222 Wiles, C. A., Romberg, T. A., and Moser, J. M. The relative effectiveness of two different instructional sequences designed to teach the addition and subtraction algorithms, 1972.

No. 235 Montgomery, M. E. The interaction of three levels of aptitude determined by a teach-test procedure with two treatments related to area, 1972.

No. 245 McLeod, D. B. The effectiveness of an inservice program for implementing an activity approach to learning mathematics in the elementary school, 1972.

No. 248 Hubbard, W. D. Developing Mathematical Processess: A report of the 1971-72 field test, 1972.

No. 286 Perham, Bernadette. Teaching behaviors and criterion-referenced student performances in mathematics, 1974.

No. 324 Hubbard, W. D. and Buchanan, A. Developing Mathematical Processes: A report of the 1972-73 field test, 1975.

No. 336 Abernatha, E. and Wiles, C. A. A Three month trial of developing mathematical processes (DMP) with ten educable mentally retarded children, 1975.

In-House or Unpublished Research: All research is published, either as R & D Center reports or as theses or dissertations.

Availability of Evaluative Data: Write to the DMP Project at the Wisconsin R & D Center.

PROJECT PUBLICITY:

Romberg, T. A. DMP: Instructional programming in math. IGE News, 1976, 7, 20-24.
Whitaker, D. R. Update: New implementation centers for DMP. IGE News, 1976, 7, 16-17.
Montgomery, M. E. DMP with a little help from our teachers and children. IGE News, 1974, 5, 16-19.
Harvey, J. G., & Romberg, T. A. Educational research in mathematics at the University of Wisconsin. Journal for Research in Mathematics Education, 1973, 4, 243-250.
Moser, J. M. Grouping of objects as a major idea at the primary level. The Arithmetic Teacher, 1971, 18, 301-305.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Revision and commercial publication of Levels 3-4 materials.
Continued field testing and revision of Levels 5-6 materials for commercial publication.

PLANS FOR THE FUTURE:

Commercial publication of Levels 5-6 materials.
Revision of teacher inservice and implementation materials.
Development of Skill and Concept Maintenance Kits.
Development of Terminal Accountability Tests.

THE DEVELOPMENT OF COMPETENCY BASED MODULAR EXPERIMENTS IN POLYMER SCIENCE AND TECHNOLOGY (MOD)

Polytechnic Institute of New York
333 Jay Street
Brooklyn, New York 11201
U.S.A.

Telephone: (212) 643-3070

Director: E. M. Pearce

Project Duration: 1975-1977

Age: 18+
Ability: average, above average
Subject: chemistry, material science
Language: English
Translations: none
Testing of Students: lab reports, written achievement tests

Materials Developed by Project:

Print	Non-Print
Lab Books	None

Types of Learning Experiences: Lab Activities

PRINCIPAL PROFESSIONAL STAFF:

C. E. Wright, Research Associate, Developmental

PROJECT HISTORY:

Principal Initiator(s): E. M. Pearce

Reason(s) for Project Initiation: Lack of material in area.

Evolution and Development of the Project: Questionnaire sent to individuals in industry and academics to determine direction and scope of project.

PROJECT OBJECTIVES:

Overall Project Purpose: To further education in the polymer field.

Specific Objectives: To supply a cohesive, but modular laboratory for institutions desiring to give polymeric laboratory experience to students or entry level industrial personnel.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Primarily intended for college seniors, beginning graduate students and entry level industrial personnel who need laboratory experience in conjunction with or following a lecture course in polymer science.

Ways in which it differs from similar or previous programs: Range of experiments is as wide as necessary without attempting to be all-encompassing. Experiments are designed to illustrate important points in as short a time span as possible (3 hours), with provision for expansion given extra time. Materials will be reviewed by a large audience, so as to give them wide acceptability.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material

The Preparation of Nylon-II and Kinetics of Polycondensation. Cost & Source not given.

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: Not answered

ADDITIONAL MATERIALS BEING DEVELOPED: Fifteen laboratory experiments in all.

MOD (2)

TEACHER PREPARATION:

Consultant Services: Text references.

Pre-service and In-service Training: None

Pre-service and In-service Teaching Materials: None

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Availability of Evaluative Data: A refereeing procedure will be conducted by industrial and academic personnel. All interested individuals are welcome.

PROJECT PUBLICITY:

Paper delivered - Society of Plastics Engineers, Inc.
34th Annual Technical Conference
April 26-29
Chalfonte-Haddon Hall, Atlantic City, N. J.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE: Fifteen modular experiments

EDUCATION AND EXPERIENCE IN ENGINEERING (E^3)

E^3 Program Center
Illinois Institute of Technology
10 West 32nd Street
Chicago, Illinois 60616
U.S.A.

Telephone: (312) 567-3190/91

Director: T. P. Torda

Project Duration: 1971-1976

Age: 18 +
Ability: above average
Subject: engineering, chem, phys, math, soc. sci.
Language: English
Translations: none
Testing of Students:
- teacher judgments
- self evaluation
- peer evaluation

Materials Developed by Project:

Print	Non-Print
Programmed Units	None

Types of Learning Experiences:
- Seminar
- Discussion
- Independent Study
- Lab Activities
- Field Experiences

PRINCIPAL PROFESSIONAL STAFF:

8 and 1/2 full-time equivalent part-time faculty from different departments (engineering, sciences, social sciences, humanities, etc.)

PROJECT HISTORY:

Principal Initiator(s): T. P. Torda

Reason(s) for Project Initiation:

Perceived the need for a new interdisciplinary undergraduate engineering curriculum; project based and self paced.

Evolution and Development of the Project:

One year of planning and four years of implementation

PROJECT OBJECTIVES:

The overall project purpose is the education of interdisciplinary problem solvers as professional (in the classical sense) engineers.

Specifically, the objectives are for students to become motivated learners, self pacers, self evaluators, managers of projects, and be able to work with others in different fields and with differing competencies.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: undergraduate engineering students from all socio-economic backgrounds.

Ways in which it differs from similar or previous programs: A completely new approach to engineering education.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material

over 600 learning modules in various science and engineering subjects

Source

E^3 Program Center, Illinois Institute of Technology, Chicago, Illinois 60616

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE:

All material will be available when edited and printed, however, much of the material will be available on a cost basis only.

ADDITIONAL MATERIALS BEING DEVELOPED: None

TEACHER PREPARATION:

Consultant Services: workshops either at E^3 Program Center or at locations agreed on, if convenient

Pre-service and In-service Training: workshops at E^3 Program Center and at national meetings

Pre-service and In-service Teaching Materials: only instruction by members of the E^3 staff

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Name of Outside Evaluators: None

Pertinent Research Studies: program evaluation is ongoing. Results will be published in the reviewed literature.

In-House or Unpublished Research: longitudinal evaluation -- ongoing

Availability of Evaluative Data: Contact the Program Director.

PROJECT PUBLICITY:

various ASME preprints, articles in the ASEE Journal, article in: INDIVIDUALIZED INSTRUCTION IN ENGINEERING EDUCATION ASEE publication, 1974

PROJECT ACTIVITIES SINCE 1974 REPORT:

continued development of the Program

PLANS FOR THE FUTURE:

Integrate Program into IIT-s educational efforts

EDUCATIONAL MODULES FOR MATERIALS SCIENCE AND ENGINEERING (EMMSE)

EMMSE Coordinator
Materials Research Laboratory
Pennsylvania State University
University Park, Pennsylvania 16802
U.S.A.

Telephone: (814) 865-3421

Director: Rustum Roy

Project Duration: 1974-1977
(unless extended)

Age: 18+
Ability: above average
Subject: materials science, engineering
Language: English
Translations: none
Testing of Students:
written achievement tests, lab performance tests, student attitude q're

Materials Developed by Project:

Print
- Supplementary Books (Modules)
- Field Guides
- Eval. Materials
- Behavorial Objectives
- Overview
- Newsletters
- Media Index
- Module Development Manual (for authors)

Non-Print
- Slides
- Filmstrips
- Filmloops
- Films
- Overhead Trans.
- Videotape
- Slide Tape

Types of Learning Experiences:
- Independent Study
- Televised Lessons
- Audio Visual
(option of traditional or individualized, independent study, with emphasis on the latter)

PRINCIPAL PROFESSIONAL STAFF:

Professor Bruce Knox, Assistant Project Director

PROJECT HISTORY:

Principal Initiator(s): Professor Rustum Roy
Professor Clifford A. Hewitt

Reason(s) for Project Initiation: The poor utilization of innovative educational materials due to the lack of faculty awareness, limited dissemination efforts, and a low level of science community acceptance.

PROJECT OBJECTIVES:

Specific Objectives:

1. Develop contacts with a broadly selective audience and conduct a consciousness raising effort on behalf of novel modular forms of instruction in the MSE discipline.
2. Establish a National Committee that is representative of the range of materials and the constituency of the field.
3. Conduct a survey of the materials community to determine the extent of interest and use of educational technology, the availability of media of all kinds, and the gaps in the system.
4. Hold an orientation and planning session for the National Committee and continue to meet with them regularly as required by the development of the project.
5. Begin to evolve the following:
   a) A rational framework of subject matter for MSE in the form of a two dimensional matrix (phenomenon and class of materials) to provide easy identification of and access to the modular material.
   b) A system for stimulation and reward of work on new or existing modular material which would include editorial review and professional recognition.
   c) A set of prototype modules and other reference materials as guidelines for prospective authors in the downstream operation of the project.
   d) Methods of communicating with our constituency to achieve the consciousness raising aims of the program and to set in motion the productive stage.

PROJECT OBJECTIVES:

Specific Objectives: (Continued)

6. Organize and publish a media index for MSE to cover all existing media, which will serve also in future editions, as the "showcase" for materials produced as part of the project.
7. Conduct a National Colloquy to make MSE colleagues aware of the nature and scope of EMMSE and provide for their input at an early stage of development.
8. Produce print modules and other media for entry into the system.
9. Promote EMMSE to its constituency.
10. Develop a method of production and distribution that will be effective and compatible with the requirements of both the initial test period and a steady state operation.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Upper level College and Graduate students.

Ways in which it differs from similar or previous programs: Focused on Materials Science and Engineering.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Module Development Manual (for authors)	Free	EMMSE
Two issues of PREVU/REVU (EMMSE News Report)	Free	EMMSE
Media Index (compiled from all appropriate media)	Free	EMMSE
Prototype Modules (demonstration units to guide future authors)	Free	EMMSE
Curricular Matrix (40 subject areas and 11 materials categories in orthogonal presentation)	Free	EMMSE

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: See Materials Already Produced above.

ADDITIONAL MATERIALS BEING DEVELOPED:

Indeterminate number of modules over the next several years (possibly 100 or so).

TEACHER PREPARATION:

Consultant Services: None developed yet.

Pre-service and In-service Training: None developed yet.

Pre-service and In-service Teaching Materials: None developed yet.

PROJECT EVALUATED:

Yes X No ___ Internal ___ External Agency ___

In-House or Unpublished Research: Except for analysis of survey of media and personnel resources - none.

Availability of Evaluative Data: None. So far, only peer review evaluation.

PROJECT PUBLICITY:

The following journals (or other publications) have published articles about EMMSE:

1. Materials Division Newsletter (Amer. Soc. for Eng. Ed.) Fall Newsletter, 1974
2. Science Trends (Trends Publishing Inc.) Vol XXXIV, Number 21, August 18, 1975
3. Newsletter (Metals and Ceramics Information Center) Vol. 5, Number 5, May, 1975

PROJECT PUBLICITY: (Continued)

4. Materials and Resources News (Federation of Mats. Societies) Number 3, November 1975
5. Journal of College Science Teaching (NSTA), Vol. V, No. 2, November 1975.
6. Tech Ed News (Vishay Research and Education Corp.), No. 12, October 1975.
7. Chemical and Engineering News (Amer. Chem. Soc.) (Volume number and date not currently available)

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE:

1. Communication to MSE community and establishment of dissemination channels;
2. Interface with groups from other disciplines and the development of a subfield taxonomy;
3. Establish topical area teams (TAT) for selection and review;
4. Prepare Index for distribution and review; and
5. Prepare and distribute new modular materials.

EDUCATIONAL RESEARCH COUNCIL MATHEMATICS PROGRAM (ERCMP)

Mathematics Department
Educational Research Council of America
614 Superior Avenue, N.W.
Cleveland, Ohio 44113
U.S.A.

Telephone: (216) 696-8222, EXT. 214

Director: John F. Mehegan

Project Duration: 1959-

Additional information, see also Clearinghouse Reports: 9, 8 and the 20-Year Cumulative Directory for title change.

Age: 5-18
Ability: all
Subject: math
Language: English
Translations: none
Testing of Students:
written achievement tests, teacher judgments

Materials Developed by Project:

Print
- Textbooks
- Supplementary Books
- Tchr. Manuals
- Eval. Materials
- Behavioral Objectives
- Overview
- Newsletters

Non-Print
- Filmstrips
- Overhead Trans.
- Games
- Models

Types of Learning Experiences:
- Lecture
- Discussion
- Demonstrations
- Audio-Visual

PRINCIPAL PROFESSIONAL STAFF:

John F. Mehegan, Director
William T. Hale, Assistant Director
S. Edwin Humiston, Research Associate
Rae Marie Creps, Research Associate
Mary Muesegaes, Research Associate

PROJECT HISTORY:

Principal Initiator(s): Dr. George H. Baird, President of Educational Research Council.

Reason(s) for Project Initiation: To develop mathematics program in response to request of superintendents.

Evolution and Development of the Project:
1. K-3 published in 1961
2. K-6 published in 1965
3. 7-8 published, K-6 revised in 1968
4. K-6 revised and published in separate units and 13 books for K-6 in 1975
5. Material for 7-8 being written in 1976

PROJECT OBJECTIVES:

Overall Project Purpose: To develop, for all children in grades K-12, an individualized, comprehensive, sequential mathematics program that is both mathematically correct and pedagogically sound.

Specific Objectives: To develop: 1) the ability to analyze and solve problems; 2) the ability to compute commensurate with needs; 3) the ability to perceive and apply geometric relationships; 4) the ability to apply measurement concepts and skills; and 5) self-confidence and a positive self-image when involved in mathematical situations on the job, in the market place, and at home.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All pupils in grades K-12.

Ways in which it differs from similar or previous programs:
1. Objectives and related tests.
2. The development of the concept of decimal numeration and computation with decimals *before* computation with fractions.
3. The method of subtraction that reduces by 36 the number of subtraction facts that have to be memorized.

UNIQUE CHARACTERISTICS OF THE PROJECT: (continued)

Ways in which it differs from similar or previous programs: (continued)

4. The "carry" problem and the "borrow" problem are presented before patterns are established that have to be unlearned.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
K-7 Pupil Texts and Teacher Guides	Not Given	ERCA*
Games, Investigations, and Manipulative Materials	Not Given	ERCA
A Pupil Placement System	Not Given	ERCA
Pupil Progress Report	Not Given	ERCA
A BASIC Primer	Not Given	ERCA
Elementary Functions with BASIC	Not Given	ERCA
Scope and Sequence	Free	ERCA
A Brochure Describing the ERCMP	Free	ERCA

*ERCA: Educational Research Council of America, 614 Superior Avenue, N.W., Cleveland, Ohio 44113, U.S.A.

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: From ERCA:

Scope and Sequence
A Brochure Describing the ERCMP

ADDITIONAL MATERIALS BEING DEVELOPED:

Kits of diversified learning materials and Text material for Grade 8.

TEACHER PREPARATION:

Consultant Services: The ERCMP staff (all teachers) is available at all times to conduct workshops, teach demonstration lessons, and assist in implementing the program.

Pre-service and In-service Training: In-service workshops at the Council or at schools at the cost of $25 per day per participant. Free to teachers for schools participating in the Educational Research Council.

Pre-service and In-service Teaching Materials: None

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Name of Outside Evaluators: None

Pertinent Research Studies: None

In-House or Unpublished Research: A study to evaluate the relative merits of the two sequences - fractions before decimals or decimals before fractions. The study showed that the presentation of decimals before fractions is at least as effective as fractions before decimals.

Availability of Evaluative Data: Write to the Mathematics Department of the Educational Research Council.

PROJECT PUBLICITY: None

ERCMP (3)

PROJECT ACTIVITIES SINCE 1974 REPORT:

Development of K-7 materials in book form: K, 1a, 1b, 2a, 2b write-in texts 3a, 3b, 4a, 4b, 5a, 5b, 6a, 6b, Secondary Book 1, Secondary Book 2 in non-consumable form.

PLANS FOR THE FUTURE:

Completion of Secondary Book 3 and Secondary Book 4 for Grade 8.
Kits of diversified learning materials for Grades K-8.

EDUCATIONAL RESEARCH COUNCIL (ERC)
UNIFIED SCIENCE PROGRAM

Science Department
Educational Research Council of America
614 West Superior Avenue - Rockefeller Building
Cleveland, Ohio 44113
U.S.A.

Telephone: (216) 696-8222

Director: Gary D. Day
Project Duration: 1971 -

Additional information, see also Clearinghouse Reports: 9 and the 20-Year Cumulative Directory for title change.

Age: 12-18
Ability: all
Subject: unified science, eng/tech, anthropology, psychology
Language: English
Translations: none
Testing of Students: written achievement, lab performance and standardized tests; teacher judgments, student attitude q're

Materials Developed by Project:

Print	Non-Print
Textbooks	Slides
Lab Books	Overhead Trans.
Supplementary Books	Audiotape
Programmed Units	Games
Tchr. Manuals	Lab Equipment
Eval. Materials	
Behavioral Objectives	
Overview	

Types of Learning Experiences:

Lecture
Seminar
Discussion
Independent Study
Lab Activities
Field Experiences
Demonstrations
Simulations
Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

Dr. Gary D. Day, Project Director
Dennis L. Harvey, Research Associate in Science
Ernest J. Fena, Research Assistant in Science

PROJECT HISTORY:

Principal Initiator(s): Dr. George H. Baird, John W. Dye

Reason(s) for Project Initiation: Change in philosophy, develop new course.

PROJECT OBJECTIVES:

Overall Project Purpose: The ERC Unified Science Program is composed of Units, each designed to take from four to nine weeks of class time. These Units are based on concepts and themes that cut across the disciplines of science. Where a series of discipline-centered courses implicitly emphasizes differences between the sciences, ERC Unified Science emphasizes commonalities. Each Unit utilizes Activities from the view of two or more disciplines.

The Units are designed to be flexible and useful in a variety of school settings from Grades 6-12. They may be used to construct a school's total science program, to supplement existing courses, or to provide minicourses.

The Units may be used in a variety of classroom situations. (1) In a lecture-laboratory situation, students may study together only those Activities selected by the teacher. (2) The teacher may choose to arrange the classroom into learning stations, with small groups of students studying a different Activity in turn from station to station. (3) The Units are especially useful for individualizing instruction.

Since each Activity contributes to the Unit objectives, individual students may choose Activities for studying aspects of science that are particularly interesting to them.

Specific Objectives: Students should develop:

1. An understanding of the major concepts of science in the context of several disciplines.
2. A knowledge of the nature of science through practicing scientific methods.
3. The ability to make rational decisions concerning job, home, and large social problems.
4. A personal effectiveness in a changing environment.

ERC (2)

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: A flexible program for all students grades 6-12, with provision for individual differences within the program structure.

Ways in which it differs from similar or previous programs: Aspects of many sciences and social science in each unit. Group and individual investigations possible within the format. Student activity based. Uses of science and scientific thinking emphasized.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Asking Questions or Starting Inquiry		ERC
Teacher's Guide	$1.10	
Student Text (7 activities on asking questions)	1.16	
Series of 58 35mm slides	36.00	
Perceiving My World:		ERC
Teacher's Guide	1.36	
Student Text (8 activities on perception)	1.70	
Series of 40 35mm slides	26.00	
Cassette Tape	4.40	
Mind Expanders (Instruments)		ERC
Teacher's Guide	1.66	
Student Text (8 activities on Instruments)	1.70	
Making Sense (of Data)		ERC
Teacher's Guide	1.66	
Student Text (7 Activities on Analyzing Data)	1.16	
Series of 9 35mm slides	6.20	
Cassette Tape	4.20	
Experimenting		ERC
Teacher's Guide	1.10	
Student Text (7 activities on Experimenting)	1.16	
Series of 6 35mm slides	4.20	
Cassette Tape	4.20	
It's Time for A Change (The Concept of Change)		ERC
Teacher's Guide	1.36	
Student Text (8 Activities on Change)	1.70	
Series of 8 35mm slides	5.20	
Systems (Let's Get It All Together)		ERC
Teacher's Guide	1.36	
Student Text (8 activities on Systems)	1.16	
Decisions Game	5.70	
What's The Matter With Energy? (Energy Sources)		ERC
Teacher's Guide	1.36	
Student Text (11 activities on energy sources)	1.70	
Fooling Around With Mother Nature (Ecosystems)		ERC
Teacher's Guide	1.36	
Student Text (14 activities on ecosystems)	1.70	
Interaction		ERC
Teacher's Guide	.86	
Student Text (4 activities on interaction)	1.20	
The Down-The-Hill Gang (Equilibrium)		ERC
Teacher's Guide	Not Given	
Student Text (14 activities on equilibrium)	1.60	

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (Continued)

Material	Cost	Source
Patterns		ERC
Teacher's Guide	Not Given	
Student Text (15 activities on patterns)	$2.20	
Set of 6 overhead transparencies	6.40	
Chinese Numbers (Checkpoint)	1.60	
Models		ERC
Student Texts (8 activities on models)	Not Given	
Check Out	Not Given	
Consumer Science		ERC
Teacher's Guide	1.20	
Student Text (10 activities on product testing and evaluating)	1.70	
Populations		ERC
Student Text (7 activities on living and nonliving populations	1.10	
Check Out	Not Given	
Hierarchies		ERC
Student Text (12 activities on hierarchical patterns)	1.70	
Check Out	Not Given	
Metric Measurements		ERC
Teacher's Guide	Not Given	
Student Text (6 activities on metric measurement)	Not Given	
Check Out	$4.00/100	
How Well Do You Know the Metric System? (Quiz)	4.00/100	
Analogies		ERC
Teacher's Guide	Not Given	
Student Text (6 activities on analogies)	Not Given	
Check Out	Not Given	
Resource Activities		ERC
Resource Activity 1/Reading Instrument Scales	$5.20	
Resource Activity 2/Mathematical Aids to Finding Patterns	2.70	
Resource Activity 3/Chemical Formulas, Balancing Equations and Mass-Mass Problems Made Easy	1.90	
Resource Activity 4/Flowcharting	1.70	
Resource Activity 5/Think Metric	$4.00/100	

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: Flier, Brochure, Materials & Price List.

ADDITIONAL MATERIALS BEING DEVELOPED:

The ERC Unified Science Program is in a state of continuous development. Units presently under development or being considered are: Time, Motion, Balance, Energy Use and Conservation, Learning, Stability, Ethics and Science, Transportation, Growth, Forces, Statistics and Variation, Fields, Communication, Symmetry, Resonance, Relativity, Food, Materials Technology, Feedback, Boundaries in Science, Thresholds, Inertia.

TEACHER PREPARATION:

Consultant Services: The Members of the ERC Science Department are prepared to aid teachers in planning and implementing changes in curriculum and instruction and to design science programs to fit specific situations.

TEACHER PREPARATION: (Continued)

Pre-service and In-service Training: Workshops and consultants upon request at $175.00 per day plus expenses.

Pre-service and In-service Teaching Materials: Teacher Guides & Student Materials.

PROJECT EVALUATED:

Yes ____ No _X_ Internal ____ External Agency ____

Pertinent Research Studies: None

Availability of Evaluative Data: Not at present -- we expect to have data available in the near future.

PROJECT PUBLICITY:

ERC Reports
AAAS Science Education News - January 1975
The Science Teacher (Notes) April 1976
Unified Science Premises and Prospects (FUSE) 1975 p 94.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Models, Populations, Hierarchies, Metric Measurement, Consumer Science, Analogies, and Interaction.

PLANS FOR THE FUTURE:

To develop Units for middle and junior high school (1976-78).
To field test and revise all Units for ultimate national publication (1977-79).
Proposed topics: Time, Cycles, Balance, Thresholds, Stability, Forces, Ethics, Growth.

ELEMENTARY MATHEMATICS CONCEPTS WITH CALCULATORS (EMC^2)

Lawrence Hall of Science
University of California
Berkeley, California 94720
U.S.A.

Telephone: (415) 642-4255

Director: John D. Miller and
Arthur Kessner

Project Duration: 1973-

Age: 4-12
Ability: all
Subject: math
Language: English
Translations: none
Testing of Students:
new keeping track system using ballots

Materials Developed by Project:

Print	Non-Print
Activity Sheets	Games
Tchr. Manuals	Models
Eval. Materials	
Overview	
Charts	

Types of Learning Experiences:

Independent Study
Organization of Activity Modules

PRINCIPAL PROFESSIONAL STAFF:

Twila Suttle, Research Assistant
Diane Stone, Research Assistant

PROJECT HISTORY:

Principal Initiator(s): John D. Miller
Arthur Kessner

Reason(s) for Project Initiation: It was anticipated that hand-held calculators would become common place through dropping manufacturing costs. We wished to provide teachers positive alternatives for using the machines to teach basic math skills.

Evolution and Development of the Project: Miller sent a letter of inquiry to Texas Instruments in November, 1973. Kessner was exploring instructional uses for calculators with children about this time. Texas Instruments learning center staff met at the Lawrence Hall in March, 1974 and planning for the project was initiated.

PROJECT OBJECTIVES:

Overall Project Purpose: The central objective of the project is to provide teachers with constructive instructional alternatives for teaching basic mathematics skills using hand-held calculators. The calculator is used to link concrete objects through tactile motion to abstract symbols displayed as visual feedback.

Specific Objectives: Mathematical Concepts considered in the project design include:
numeral recognition
one-to-one correspondence
counting
estimation
computation
place value
problem solving
inequalities
conservation of number in space and time
number sentences

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students in grades K-6

UNIQUE CHARACTERISTICS OF THE PROJECT: (Continued)

Ways in which it differs from similar or previous programs: It employs hand-held calculators to teach basic mathematics concepts. It is designed to allow peer teaching to occur for the very young children. It is activity based to teach fundamental mathematics skills. It employs special machines with limited numbers of numeral keys which may be adjusted as a child's skill develops.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
A set of K-1 materials, field tested with more than 800 children at six sites in the United States. These materials are organized into nine activity modules, to supplement existing mathematics curricula. Teachers' guide included.	Not answered	Texas Instruments
A set of 2-3 materials, also in module format. These materials are scheduled for field testing in 1976-77.	Not available yet	Texas Instruments
A set of exploratory materials for 4-6 in activity card format. These materials have received limited testing with children. Teacher's guide included.	Not answered	Texas Instruments
Comprehensive color catalog	Free	Texas Instruments

PRESENT COMMERCIAL AFFILIATIONS:

Texas Instruments, Incorporated
P.O. Box 5012, M/S 54
Dallas, Texas 75222 (indicate interest in elementary program)

MATERIALS AVAILABLE FREE:

From Texas Instruments Incorporated, a comprehensive color catalog.

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION:

Consultant Services: Regional consulting services available throughout the United States.

Pre-service and In-service Training: Information available from Texas Instruments Incorporated.

Pre-service and In-service Teaching Materials: Information available from Texas Instruments, Incorporated.

PROJECT EVALUATED:

Yes X No ___ Internal ___ External Agency X

Name of Outside Evaluators: Syracuse University

Pertinent Research Studies: None listed

In-House or Unpublished Research: Formative research data is currently in raw form.

Availability of Evaluative Data: Contact Texas Instruments Incorporated.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

ENVIRONMENTAL EDUCATION (EE)

Environmental Education Division
Florida Audubon Society
Maitland, Florida 32751
U.S.A.
Telephone: (305) 647-2615

Director: Carla Palmer
Project Duration: 1974-1975

Age: 5-adult
Ability: all
Subject: biol, chem, earth-space, math, soc. sci., eng/tech, ed tech, creative arts, language arts
Language: English
Translations: none
Testing of Students: none

Materials Developed by Project:

Print	Non-Print
Tchr. Manuals	Slides
Behavioral Objectives	Filmstrips
Overview	Audiotape
Newsletters	Workshops

Types of Learning Experiences: Not answered

PRINCIPAL PROFESSIONAL STAFF:

Carla Palmer, Vice President

PROJECT HISTORY:

Principal Initiator(s): Carla Palmer

Reason(s) for Project Initiation: Need for teacher workshops, energy curriculum materials, and newsletter in Florida.

Evolution and Development of the Project: Applied for and received Federal funding through HEW office of Technology and Environmental Education.

PROJECT OBJECTIVES:

Overall Project Purpose: Provide teacher and youth training in environmental education as well as develop learning modules on energetics.

Specific Objectives: To Produce:

4 workshops
3 learning modules w/teacher's guides
1 "Florida's Endangered Species" coloring book

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Teachers, youth workers, classroom volunteers, community members, students in grades K-12, introductory college.

Ways in which it differs from similar or previous programs: There is no similar project in the State of Florida. There are no programs on energetics to date.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Learning Modules with Teacher's Guides: How Things Work Florida's Urban Environment Endangered Species	Not Given	EE
Filmstrip/audio cassette	free loan	EE
Coloring Book	*$1.00	EE
EE Newsletter	$3.00 yr.	EE

* $.80 for orders over 10

PRESENT COMMERCIAL AFFILIATIONS: Not answered

MATERIALS AVAILABLE FREE: Not answered

EE (2)

ADDITIONAL MATERIALS BEING DEVELOPED:

On going EE program at Florida Audubon with continuation of workshop program, newsletter and consultant services.

TEACHER PREPARATION:

Consultant Services: Demonstration, teaching concepts.

Pre-service and In-service Training: Workshops in out-of-the-way places, camps etc.- weekends - paid for by teachers and supportive Audubon chapters from around the state.

Pre-service and In-service Teaching Materials: Teacher's guides with learning modules.

PROJECT EVALUATED:

Yes ____ No X___ Internal ____ External Agency ____

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE:

Energy conservation - emphasis on mathematics and science in how energy is used and how it can be conserved. Train teachers, students and community.

ENVIRONMENTAL EDUCATION SERVICE CENTER (EESC)

A.C.E.S.
800 Dixwell Avenue
New Haven, Connecticut 06511
U.S.A.

Telephone: (203) 562-9967

Director: Larry Schaefer

Project Duration: 1970-

Age: 7-adult
Ability: all
Subject: environmental ed, biol, chem, earth-space, math, social sciences, computer science
Language: English
Translations: none
Testing of Students: written achievement tests, teacher judgments, student attitude questionnaire

Materials Developed by Project:

Print
- Activity Sheets
- Tchr. Manuals
- Behavioral Objectives

Non-Print
- Slides
- Slide Tape
- Audiotape
- Games

Types of Learning Experiences
- Lecture
- Seminar
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Demonstrations
- Simulations
- Audio-Visual

PRINCIPAL PROFESSIONAL STAFF:

Larry Schaefer
Harry O. Haakonsen
Dwight Smith

PROJECT HISTORY:

Principal Initiator(s): Larry Schaefer

Reason(s) for Project Initiation: Needs assessment

PROJECT OBJECTIVES:

Overall Project Purpose: To develop self-instruction materials in environmental education.

Specific Objectives: Specific self-instruction materials in: 1) land use decision making; 2) ecology; and 3) environmental issues.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students in grades K-12, and at the community college or introductory college level.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Land Use Decision Making Kit (LUDK) (sixteen audio-tutorial self instructional units)	$200.	E-P Education Serv.
Eco-Kit (six self instructional audio-tutorial units)	$ 30.	E-P Education Serv.
An Introduction to Population, Environment and Society - A Teachers Resource Manual.	$ 6.	E-P Education Serv.
Metric Poker - An education game designed to have students think and calculate in Metric System.	$3.75	E-P Education Serv.

PRESENT COMMERCIAL AFFILIATIONS:

E-P Education Services
800 Dixwell Avenue
New Haven, Connecticut 06511

MATERIALS AVAILABLE FREE: None

EESC (2)

ADDITIONAL MATERIALS BEING DEVELOPED:

Planafam - A simulation game of family planning.

S.E.E.D. - ABC's of Ecology - A simulation game for elementary schools.

TEACHER PREPARATION:

Consultant Services: Full range of pre-service and in-service workshops.

Pre-service and In-service Training: Workshop cost dependent on design for school; summer school course at Albertus Magnus College - $150/student.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Name of Outside Evaluators: None

Availability of Evaluative Data: Contact project director

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE: Not answered

ENVIRONMENTAL SCIENCE CONCEPTS AND PROCESSES-ENQUIRY (ESCAPE)

South Colonie School District
Albany, New York 12205
U.S.A.

Telephone: (518) 456-2440

Director: William T. Peruzzi

Project Duration: 1973 -

Age: 11-13
Ability: all
Subject: envir. science, unified science
Language: English
Translations: none
Testing of Students:
- written achievement tests
- standardized tests
- teacher judgments
- student attitude q're
- SCACL (science classroom activity checklist)

Materials Developed by Project:

Print	Non-Print
Modules	Slides
Activity Sheets	Overhead Trans.
Tchr. Manuals	Slide Tape
Eval. Materials	
Behavioral Objectives	
Overview	

Types of Learning Experiences:
- Lecture
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Demonstrations
- Simulations
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

Members of the writing team:
Thomas Rourke, Science Coordinator
Joanne Butterfield
Robert Clark
Anthony Corraro
Donna Golden
Robert Hotis
John Kuzma
Michael Lancor
Karen Lewanick
Robert Meyer
Linda Novak
Linda Bacon, Art
Paul Gordon, Grade 6 teacher
Ted Guthridge, Science
Diane Henderson, Math
Eric Lawrence, Science
Gloria Moran, Reading
John Whitney, Math

PROJECT HISTORY:

Principal Initiator(s): Science teachers from Sand Creek Junior High School. Idea from a FUSE workshop.

Reason(s) for Project Initiation: Dissatisfaction with existing junior high school programs as well as a belief in unified science.

Evolution and Development of the Project:

1. Dissatisfaction with the Sand Creek science program by students and staff was indicated by a needs survey.
2. In 1973, the science department submitted a proposal for curriculum writing project to the Colonie Curriculum Review Board.
3. During the 1973-74 school years, the project was approved and the FUSE model for a modular unified science program was adopted.
4. The writing of the project was done during the summer of 1974 and the 1974-75 school year.

PROJECT OBJECTIVES:

Overall Project Purpose:

1. To form a more enjoyable and more exciting view of the world.
2. To use science concepts, process skills and values in making everyday decisions as students interact with other people and with their environment.
3. To develop students' ability to learn on their own.

ESCAPE (2)

PROJECT OBJECTIVES: (continued)

Specific Objectives: Specific behavioral objectives are given at the beginning of each unit for each level of the program.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Designed for students in 7th and 8th grades (age 12-13) in a suburban school district, with most residents in the middle income range.

Ways in which it differs from similar or previous programs: FUSE models provided the format for the ESCAPE Program. ESCAPE is different from the FUSE model in the following ways:

1. The alternative modules are placed in groups of 2 or 3 modules and students choose 1 out of the group. Most FUSE models allow students to choose freely from a large number of alternative modules.
2. Enabling and terminal objectives are listed on each module to familiarize students with objectives.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Unit Titles - Grade 7:	$2.00/Module $15.00/Unit	ESCAPE
1. Primary Processes		
2. Models		
3. Controlling Variables		
4. Cycles		
5. Interactions		
6. Systems		
7. Local Aquatic Ecosystems		
Unit Titles - Grade 8:	$2.00/Module $15.00/Unit	ESCAPE
1. Hypothesizing and Experimenting		
2. Equilibrium		
3. Environmental Controls		
4. Earth Crises		
5. Alternative Futures		
6. Local Land Ecosystems		
7. You and Your Future		

PRESENT COMMERCIAL AFFILIATION: None. Local production only.

MATERIALS AVAILABLE FREE:

Project Description and one sample module (free except for postage costs).

ADDITIONAL MATERIALS BEING DEVELOPED:

Teacher Supplements, Glossary and Remedial and Enrichment Modules.

TEACHER PREPARATION:

Consultant Services:
1. FUSE Center at Ohio State University, Columbus, Ohio
2. Teachers from Sand Creek Junior High Science Department

Pre-service and In-service Training: FUSE Unified Science Workshops and South Colonie In-service course.

ESCAPE (3)

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

In-House or Unpublished Research:

Formative evaluation was accomplished by using a series of faces which allow the participants to indicate their general feelings by simply choosing a face with an expression that matches their feelings at that time.

Summative evaluation was accomplished by use of the TOUS test (Test of Understanding Science) Form J, administered pre and post with an experimental and control group. The SCACL (Science Classroom Activity Checklist) was also administered pre and post.

PROJECT PUBLICITY:

"The Great Escape", New York State Environment, Vol. 5, No. 6, Dec. 1975.
"Expanding Worlds", The Conservationist, Vol. 30, No. 2, Oct.-Nov. 1975.

PROJECT ACTIVITIES SINCE 1974 REPORT: N/A

PLANS FOR THE FUTURE:

1. Continue evaluation and revision of the grade 7 units.
2. Initiate revision of the grade 8 modules.
3. Perfect the current evaluation techniques.
4. Develop both enrichment and remedial modules to supplement the program.
5. Increase the number of modules which are meant for only one or the other of the two ability groupings (average & above; average & below).
6. Assist other unified science program developers by school visits and staff assistance.

FEDERATION FOR UNIFIED SCIENCE EDUCATION (FUSE)

Box 3138
University Station
Columbus, Ohio 43210
U.S.A.

Telephone: (614) 422-1053

Director: Victor Showalter

Project Duration: 1966-

Additional information; see also Clearinghouse Reports: 9, 8 and the 20-Year Cumulative Directory for title change.

Age: 5-adult
Ability: all
Subject: unified science
Language: English
Translations: none
Testing of Students: not specified

Materials Developed by Project:

Print
- Supplementary books
- Programmed Units
- Activity Sheets
- Tchr. Manuals
- Field Guides
- Eval. Materials (tests)
- Behavioral Objectives
- Newsletters
- Simulations
- Journal

Non-Print
- Slides
- Filmloops
- Films
- Overhead Trans.
- Videotape
- Slide Tape
- Audio Tape
- Games

Types of Learning Experiences:
- Lecture
- Seminar
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Demonstrations
- Simulations
- Televised Lessons
- Audio-visual

PRINCIPAL PROFESSIONAL STAFF:

Victor Showalter, Executive Director
Barbara Thomson, Secretary-Treasurer
FUSE Board of Directors - subject to annual change
Directors of Regional Centers: David Cox, Tom Gadsden, David Howell, Al Gunter, Dick McLeod.

PROJECT HISTORY:

Principal Initiator(s): Victor Showalter, Barbara Thomson

Reason(s) for Project Initiation: to provide vehicle for self-help of those involved in unified science at local levels.

Evolution and Development of the Project: Permanent staff established in 1972 with grant from NSF to form The Center for Unified Science Education. Regional resource centers began in 1975.

PROJECT OBJECTIVES:

Overall Project Purpose:

1. Disseminate the concept of unified science education
2. Implement high quality local unified science programs
3. Develop further the concept of unified science

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: all teachers of science

Ways in which it differs from similar or previous programs: It is unique in that it fosters local development of science curriculum.

FUSE (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Abstracts of Unified Science Programs	$2.50	FUSE
Catalog of Available Modular Unit Outlines	.50	
Catalog of Workshop Modules	.50	
In Search of Unity	1.50	
Unified Science Premises and Prospects	5.50	
What Is Unified Science Education?	3.00	

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION:

Consultant Services: Many of our materials are for teacher development; A general information response system maintained by mail.

Pre-service and In-service Training: Upon request, the center will provide names of people nearby or people from the center or a regional center to conduct any or all workshops.

Pre-service and In-service Teaching Materials: The Center and regional resource centers offer a course in unified science curriculum design.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

In-House or Unpublished Research: available on request as one of Center publications.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT:

Ohio Project in Unified Science - a model for school and center collaboration in establishing unified science programs.

Establishment of regional FUSE Resource Centers coordinated by Center, in Oregon, Florida, Massachusetts, Michigan, Pennsylvania, and Australia.

PLANS FOR THE FUTURE:

Annual conferences (October)
Additional resources
Additional regional resource centers

FOUNDATIONAL APPROACHES IN SCIENCE TEACHING (FAST)

1776 University Avenue
Honolulu, Hawaii 96822

Telephone: (808) 948-7863
948-7846

Director: Francis M. Pottenger III

Additional information, see also
Clearinghouse Reports: 7, 8, 9

Age: 12-16
Ability: all
Subject: biol, chem, phys, earth-space, soc. sci., eng/tech
Language: English
Translations: Lao
Testing of Students: written achievement tests, lab performance tests, oral

Materials Developed by Project:

Print
- Lab Books
- Supplementary Books
- Programmed Units
- Activity Sheets
- Tchr. Manuals
- Field Guides
- Eval. Materials
- Overview

Non-Print
- Overhead Trans.
- Lab Equipment

Types of Learning Experiences:
- Lecture
- Seminar
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Francis M. Pottenger, III, Director
Donald B. Young, Assistant Director
Karen N. Yamamoto, Field Supervisor, Evaluator
Joan E. Snook, Teacher, Administrative Assistant
Barbara B. Thompson, Administrative Assistant
L. Reed Brantley, Physical Science Director, Emeritus
Sister Edna Demanche, Ecology Director

PROJECT HISTORY: Not answered

PROJECT OBJECTIVES:

Overall Project Purpose: FAST is designed to provide students with the scientific background necessary for understanding environmental problems which arise in a technological society, and to develop the foundational tools necessary for further study in the sciences.

Specific Objectives: The specific objectives of FAST are to increase student:

1. Capability to perform basic laboratory skills.
2. Capability to use the symbolic tools of science.
3. Knowledge of concepts that are foundational to modern science.
4. Capability to do scientific inquiry.
5. Understanding of the potential contributions of science and technology in solving environmental problems.
6. Understanding of the history of science.
7. Understanding of the relationships among sciences.
8. Knowledge of the nature of science.
9. Capability to apply a knowledge of science to other areas of endeavor.
10. Understanding of the relationships among science, technology, and society.
11. Capability to use scientific knowledge for decision making.
12. Internalization of the values, attitudes, and traits necessary for successful endeavor in science.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: The full spectrum of socio-economic, cultural and intellectual backgrounds that are found in the normal classrooms of the public and private intermediate and high schools of the State of Hawaii.

FAST (2)

UNIQUE CHARACTERISTICS OF THE PROJECT: (continued)

Ways in which it differs from similar or previous programs: FAST is an integrated science program which retains the unique character of the physical and environmental sciences. Integration is achieved by employing a third strand of content called the Relational Study. Content of this strand includes studies of the instrumental flow of knowledge from the physical science to the environmental sciences. Integration culminates in blocks of applied studies which terminate each level of the program. Through this mechanism, study is made of input of physical and environmental sciences into modern social decisions. The three applied blocks for FAST 1, 2, and 3 respectively are: Air Pollution, World Food Problems, and Population, Resources and Environmental Stress.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Student Laboratory and Field Materials for Grade 7 (FAST 1)	Not purchasable	FAST
Teacher's Guide for FAST 1		
Student Laboratory and Field Materials for Grade 8 (FAST 2)		
Teacher's Guide for FAST 2		
Student Laboratory and Field Materials for Grade 9 (FAST 3)		
Teacher's Guide for FAST 3		

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: Project Overview

ADDITIONAL MATERIALS BEING DEVELOPED:

Revisions of above materials for FAST 2 and 3 (Grades 8 & 9).

TEACHER PREPARATION:

Consultant Services: The University of Hawaii provides the services of a Field Inservice Supervisor who is responsible for in-school visitations, workshop organization and evaluation activities.

Pre-service and In-service Training: Pre-service orientation is given to students taking science methods courses in the University of Hawaii College of Education's undergraduate and graduate program. Inservice: 1) a two-week training program is given to all teachers planning to use the FAST materials at each level of the program (cost is $20/teacher on Oahu and $40.00/teacher on Neighbor Islands). 2) A two-week training program for Teacher Trainers. 3) Follow up in-depth workshops including content topics, classroom organization, classroom management, evaluation and inquiry techniques. These costs range from $5.00 to $20.00/teacher depending on length and location of workshops. Financing for these programs has come through the University of Hawaii, Hawaii Department of Education, State Office of Environmental Quality Control, and the American Lung Association.

Pre-service and In-service Teaching Materials: Teaching Training Model/Guide for FAST 1, 2, and 3; in-service workshops.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency X

Name of Outside Evaluators: Hawaii Department of Education

PROJECT EVALUATED: (continued)

In-House or Unpublished Research: The FAST materials have been found effective with students in the target population as measured by program evaluations and interviews. Teacher satisfaction has been high as evidenced by a high program retention rate.

PROJECT PUBLICITY: None

PROJECT ACTIVITIES SINCE 1974 REPORT:

The project has continued its revision cycle. The program has been disseminated to all of the major islands in the State of Hawaii. Inservice follow up workshops have been designed to further professional growth in the use of the materials.

PLANS FOR THE FUTURE:

As a continuation of the program's outreach to the Islands of the Pacific, FAST materials will be widely introduced in the Marshall Islands during the summer of 1976. Revision will continue on FAST 2 and FAST 3 materials during the academic year 1976-77.

GEOGRAPHY CURRICULUM PROJECT (GCP)

Geography Curriculum Project
107 Dudley Hall
University of Georgia
Athens, Georgia 30602
U.S.A.

Telephone: (404) 542-7265

Director: M. J. Rice

Project Duration: 1967 -

Additional Information: See Also Clearinghouse Reports 9, 8, 7

Age: 6-15
Ability: all
Subject: Geography
Language: English
Translations: none
Testing of Students:
  written achievement tests, student attitude q're

Materials Developed by Project:

Print
- Textbooks
- Supplementary Books
- Programmed Units
- Activity Sheets
- Teacher Manuals
- Evaluation Materials (tests)
- Charts

Non-Print
- None

Types of Learning Experiences:
- Lecture
- Discussion
- Independent Study

PRINCIPAL PROFESSIONAL STAFF: M. J. Rice, Director

PROJECT HISTORY:

Principal Initiator(s): M. J. Rice

Reason(s) for Project Initiation: To develop new course

Evolution and Development of the Project:

The Geography Curriculum Project originated in 1967. It has the support of the College of Education at the University of Georgia, and the assistance of the Department of Geography in curriculum development.

PROJECT OBJECTIVES:

The overall goal of the Project is a sequential curriculum in geography for grades 1-7.

More specifically, the Project is involved with the development of supplementary social studies units emphasizing the organizing concepts of the discipline of geography.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: students in grades K-10

Ways in which it differs from similar or previous programs:

The Geography Curriculum Project has two unique characteristics--its systematic approach to concept development, and its emphasis on introducing the discipline of geography in the elementary grades.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Black Population Distribution and Growth in the United States	$2.00	GCP
Comparative Rural Landscapes	2.50	GCP
Earth: Man's Home	3.00	GCP
Functions of Cities	2.50	GCP
Place of Environment	5.00	GCP
Population Growth in the United States and Mexico	1.25	GCP
Resource and Production	5.00	GCP
Transportation and the Environment	3.00	GCP

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

Handbook For Field-Teaching in Geography - available by middle of 1977

TEACHER PREPARATION: Not applicable

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Name of Outside Evaluators: None

Pertinent Research Studies:

Imperatore, W.A. 1969. Evaluation of a Conceptual Geography Unit for Kindergarten. University of Georgia, Athens, Georgia, Unpublished Doctoral Dissertation.

Pelletti, J.C. 1973. The Effectiveness of Graphic Roles in Geography Texts. University of Georgia, Athens, Georgia, Unpublished Doctoral Dissertation.

Steinbrink, J.E. 1970. The Effectiveness of Advance Organizers for Teaching Geography to Disadvantaged Rural Black Elementary Students. University of Georgia, Athens, Georgia, Unpublished Doctoral Dissertation.

Jones, F.G. The effects of mastery and aptitude on learning, retention, and time. Unpublished doctoral dissertation, University of Georgia, 1974.

Fanga, J.S. The effects of mastery and aptitude on achievement and retention. Unpublished doctoral dissertation, University of Georgia, 1975.

In-House or Unpublished Research: None

Availability of Evaluative Data:

Reports of empirical research involving classroom use of the Geography Curriculum Project materials are available from the Project. Write for list.

PROJECT PUBLICITY:

Imperatore, W.A. Nov. 1967. The Conceptual Model: A Guide to Elementary Geography Content. Journal of Geography. LXVI: 414-416.

Rice, M.J. March 1970. Pilot Project. Grade Teacher. p. 52.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Publication of two curriculum units: Functions of Cities and Transportation and The Environment.

PLANS FOR THE FUTURE:

Plans for the future include publication of a manual for field-teaching and field work in Geography.

HAWAII MARINE STUDIES SCIENCE (HMSS)

1776 University Avenue
Honolulu, Hawaii 96822
U.S.A.

Telephone: (808) 948-7885 or
948-7863

Director: Francis M. Pottenger, III

Project Duration: 1975-1979

Age: 16-18
Ability: all
Subject: biol, chem, phys, earth-space, engineering/technology, oceanography
Language: English
Translations: none
Testing of Students: written achievement tests, lab performance tests

Materials Developed by Project:

Print	Non-Print
Lab Books	Slides
Supplementary Books	Overhead Trans.
Activity Sheets	Lab Equipment
Field Guides	
Eval. Materials	
Newsletters	

Types of Learning Experiences:

- Lecture
- Seminar
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Demonstrations
- Simulations

PRINCIPAL PROFESSIONAL STAFF:

Ms. E. Barbara Klemm, Assistant Director
Dr. Tom Speitel, Writer
Dr. S. Arthur Reed, Writer
Ms. Barbara Lee, Writer

PROJECT HISTORY:

Principal Initiator(s): Curriculum Research & Development Group (CRDG)

Reason(s) for Project Initiation: To provide a one-year course in the Marine Sciences for the secondary schools of the State of Hawaii.

Evolution and Development of the Project: The program is in the first year of development. Materials as produced are tested in the University Laboratory School. The project is funded by Sea Grant and University of Hawaii.

PROJECT OBJECTIVES:

Overall Project Purpose: This marines studies curriculum will give students an understanding of the role of various disciplines, professions, and crafts involved in the study and utilization of the sea. The curriculum will give students a basic experience in chemistry, physics, biology, geology, geography, and oceanography and will relate these to engineering, aquaculture, recreation, fishing, transportation, and other aspects of our utilization of our oceanic resources.

The curriculum will give an understanding of the specific ways in which knowledge of the sea is generated and the way in which this knowledge is used to produce the technology for the preservation and employment of the sea as an economic and recreational resource.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Program is designed to serve the full spectrum of students in grades 10-12 currently enrolled in the normal classrooms of the secondary schools of the state.

Ways in which it differs from similar or previous programs: The program provides for study of the physical, biological and geophysical aspects of the marine environment, relying heavily on model building and simulations. Man's technological use of the sea, transportation, aquaculture, and resource recovery are also studied. This content base is specifically designed to interface with a marine program in Social Studies (Reported as Hawaii Marine Studies Social Science Project). Students spend 75-80% of their time in the lab or field. Materials are designed to accommodate schools which have no access to the ocean, as well as to give a rich experience to those which can regularly get classes to the shore and/or into the water.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Draft copies of student materials	Not Given	HMSS
Draft copies of reference materials	Not Given	HMSS
Report of the Hawaii Marine Education Council, describing the wider scope of the Marine Education in the State of Hawaii. Published March, 1975.	$.50	HMSS

PRESENT COMMERCIAL AFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

Teacher's Guides
Programmed Learning Materials

TEACHER PREPARATION:

Consultant Services: None at present

Pre-service and In-service Training: In-service: Preliminary background course work. Anticipating full-scale teacher training in Summer, 1977.

Pre-service and In-service Teaching Materials: Course outlines (none available)

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Name of Outside Evaluators: None

Pertinent Research Studies: None

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

HAWAII MARINE STUDIES SOCIAL SCIENCE (HMSSoSi)

Curriculum Research and Development Group
University of Hawaii at Manoa
1776 University Avenue
Honolulu, Hawaii 96822
U.S.A.

Telephone: (808) 948-7863

Directors: Ronald Mitchell and
Francis M. Pottenger III

Project Duration: 1975-1978

Age: 16-18
Ability: all
Subject: social sciences
Language: English
Translations: none
Testing of Students:
written achievement tests

Materials Developed by Project:

Print	Non-Print
Activity Sheets	Slides
Tchr. Manuals	Overhead Trans.
Eval. Materials	Games
Newsletters	Models

Types of Learning Experiences:

Lecture
Seminar
Discussion
Independent Study
Field Experiences
Simulations

PRINCIPAL PROFESSIONAL STAFF:

Mr. Ray W. Conrad
Mr. Norman Okamura
Ms. Faith Paul
Ms. Marianne Hung

PROJECT HISTORY:

Principal Initiator(s): Curriculum Research and Development Group, University of Hawaii (CRDG).

Reason(s) for Project Initiation: To provide a one-year course covering marine social studies topics for the secondary schools of the state of Hawaii.

Evolution and Development of the Project: The program is in its first year of development. Materials have been tested as produced in the University Laboratory School and pilot tested in four collaborating schools.

PROJECT OBJECTIVES:

Overall Project Purpose: The program is designed to give students understanding of the wide ranging social implications of man's use of the oceans. It capitalizes on an environment that is immediately apparent to students and on a set of issues that are a daily developing commentary in the international and local Hawaiian press. Out of this context of broad currency it is possible to develop a sense of the intricacies of man's use of the oceans and the land immediately adjacent. Idealism is contrasted with the pragmatic; economic values are contrasted with aesthetic and environmental values; national interests are contrasted with regional, state, and international jurisdictions.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: The program is designed to serve the full range of students enrolled in grades 10-12 in the normal classrooms of the secondary schools of the State of Hawaii.

Ways in which it differs from similar or previous programs: The program deals with topics that are new to the state curriculum. In particular it discusses the socio-economic implications of Shoreline and Coastal Zone Management and international regulation of the Sea (Ocean Management) as evolved over the past 500 years. The program culminates in a Simulation of United Nations Law of the Sea conferences. The program is being specially designed to articulate with a marine science program reported under the title Hawaii Marine Studies Science Project.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Draft copies of one semester material consisting of two units one on shore management and one ocean management.	Not Given	HMSSoSi
Report of the Hawaii Marine Education Council describing the wider scope of Marine Education in the State of Hawaii. Published March 1975.	$.50	HMSSoSi

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: Outlines for the remaining units of the Program.

TEACHER PREPARATION:

Consultant Services: Project staff weekly meeting with pilot teachers.

Pre-service and In-service Training: In-service course work as a background to using the materials, Program Specific workshops in the use of the Materials.

Pre-service and In-service Teaching Materials: None available

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency

Name of Outside Evaluators: None

Pertinent Research Studies: None

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

HAWAII METRIC PROJECT

University of Hawaii
1776 University Avenue
Honolulu, Hawaii 96822

Telephone: (808) 948-7158

Director: Irv King
Project Duration: 1973-1977
Additional information, see also the 20-Year Cumulative Directory for title change.

Age: 5-12
Ability: all
Subject: math, metric ed
Language: English
Translations: none
Testing of Students: written achievement tests, lab performance tests, teacher judgments

Materials Developed by Project:

Print	Non-Print
Lab Books	
Tchr. Manuals	
Eval. Materials	
Behavorial Objectives	
Overview	

Types of Learning Experiences:

- Lecture
- Discussion
- Lab Activities
- Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Kathy Berg, Curriculum Planner
Jane Haines, Artist

PROJECT HISTORY:

Principal Initiator(s): Dr. Irv King

Reason(s) for Project Initiation: State Legislative Mandate (Resolution)

Evolution and Development of the Project: The program, The 4M Company, is written and tested in the University lab school, then in a pilot school. And finally it is field tested throughout the State of Hawaii. Grades K-3 were completed first, grade 4 will be completed by June, 1976, and grades 5 and 6 by June, 1977.

PROJECT OBJECTIVES:

Overall Project Purpose: To make all students socially function with metric measurement, and to prepare students for a more technical study of metric measurement.

Specific Objectives: By the end of the sixth grade students will know the basic characteristics of the metric system. When confronted with a measurement problem students will select an appropriate measuring device, measure, and record the measurement correctly.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All children in grades K-6.

Ways in which it differs from similar or previous programs: The 4M Company is a complete metric measurement program, K-6, which can be used to supplement existing programs. It includes Piagetian conservation tasks, and decimals are introduced at the third grade level as a natural part of the metric system.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
1. The 4M Company (K) with Teachers' Guide	Not Given	Project Director
2. The 4M Company (1) " " "	"	
3. The 4M Company (2) " " "	"	"
4. The 4M Company (3) " " "	"	"
5. The 4M Company (4) " " "	"	"
6. Descriptive brochure	Free	"

PRESENT COMMERCIAL AFFILIATIONS: None

HAWAII METRIC PROJECT (2)

MATERIALS AVAILABLE FREE: Descriptive brochure.

ADDITIONAL MATERIALS BEING DEVELOPED:

The 4M Company (5) with Teachers' Guide
The 4M Company (6) with Teachers' Guide

TEACHER PREPARATION:

Consultant Services: The State Department of Education provides 2-hour workshops to teachers wishing to use the program.

Pre-service and In-service Training: University of Hawaii provides 8-16 hour metric workshops for teachers, free of charge, as part of the faculty's regular function.

Pre-service and In-service Teaching Materials: Teacher Trainer Guide, set of 101 activity cards, particpant manual ($10.00 for complete kit).

PROJECT EVALUATED:

Yes X No ____ Internal ____ External Agency X

Name of Outside Evaluators: Contract from Dept. of Educ. to Anne Nicol.

Pertinent Research Studies: None

In-House or Unpublished Research: An independent evaluator has evaluated the K-3 portion of the program. Results were given by percentage of students passing each item on test. Item sampling procedures used. Highly favorable percentages.

Availability of Evaluative Data: For a charge of $3.00, the final evaluation report can be obtained by writing the project director.

PROJECT PUBLICITY:

1. Three local newspaper articles.
2. "Going Metric in Hawaii", Arithmetic Teacher, May, 1973

PROJECT ACTIVITIES SINCE 1974 REPORT:

Continued development of 4-6. Installation of K-3

PLANS FOR THE FUTURE:

Program completion date: June 1977

HAWAII NATURE STUDY PROJECT

1776 University Avenue
Honolulu, Hawaii 96822 U.S.A.

Telephone: (808) 948-7863
948-7846
948-7793

Director: E. Demanche

Project Duration: 1973-1978

Age: 5-11
Ability: all
Subject: environ. sci, humanities
Language: English
Translations: none
Testing of Students: Lab performance tests, oral tests, tchr. judgments, interest inventories

Materials Developed by Project:

Print	Non-Print
Tchr. Manuals	Slide Tape
Field Guides	
Overview	

Types of Learning Experiences:

Discussion
Independent Study
Lab Activities
Field Experiences

PRINCIPAL PROFESSIONAL STAFF:

Sister Edna Demanche, Director
Sayo Nakagawa, Technical Assistant
Dorothy Buddemeier, Field Supervisor of pilot teachers
Barbara Culiney, Research
Pilot Teachers, Testing materials and giving feedback

PROJECT HISTORY:

Principal Initiator(s): Sister Edna Demanche

Reason(s) for Project Initiation: A need for a nature study program in grades K through 6 in the State of Hawaii.

Evolution and Development of the Project: The Hawaii Nature Study Program is an environmental education program developed at the Curriculum Research and Development Group at the University of Hawaii. The program is addressed to the natural and manmade environment of Hawaii, and is comprised of out-of-doors, campus-centered, problem-solving observations and investigations.

PROJECT OBJECTIVES:

Overall Project Purpose: The Hawaii Nature Study Program is designed to fit within the science curriculum, but it correlates with other subject areas in school as well as with local community interests. It promotes awareness, appreciation, knowledge, and understanding of the environment. The specific skills it develops prepare students for science courses in the intermediate school.

Specific Objectives:

ATTITUDES	interest. . .awareness. . .sensitivity. . .enjoyment
SKILLS	observation. . .investigative techniques. . .oral and written reporting
CONCEPTS	recognition. . .understanding. . .retention
VALUES	personal involvement in things of man and nature. . . cannot be directly taught. . .may be prepared for and caught from the personal dynamic of the teacher. . .

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All elementary school children in Hawaii.

Ways in which it differs from similar or previous programs: Uses local (tropical) campus environment as the vehicle for learning.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Overview and Order Blank	Free	Project
Parts of Plants	Not Given	
Insects	Not Given	
Spiders and other animals of the school neighborhood	Not Given	

PARTS OF PLANTS consists of observations and investigations for Kindergarten through sixth grade (Grades K-6) on plant structures using whatever plants are available in campus and home neighborhoods. Issued September, 1974. Revised edition, Sept. 1975.

INSECTS is a series of investigations for Grades K-6 utilizing insects found in most local school neighborhoods. Issued September 1975.

SPIDERS AND OTHER ANIMALS OF THE SCHOOL NEIGHBORHOOD contains investigations for Grades K-6 involving spiders, birds, lizards, sowbugs, and similar small animals (other than insects) found in most school neighborhoods. Available September 1976.

PRESENT COMMERCIAL AFFILIATIONS:

Hawaii Nature Study Project
University of Hawaii - Laboratory School
1776 University Ave., Honolulu, Hawaii 96822

MATERIALS AVAILABLE FREE: None, except 1 page overview and order blank.

ADDITIONAL MATERIALS BEING DEVELOPED:

Soil, Water, Air for Grades K-6 emphasizes the local physical environment. Available post-1976.
More Plants is a follow-up on Parts of Plants for Grades K-6. It presents plant classification, some simple plant physiology, and other plant relationships. Eventually the Hawaii Nature Study Program will have teacher and student reference aids, slides, pictures, and printed student materials.

TEACHER PREPARATION:

Pre-service and In-service Training: Bi-monthly meetings with teachers in geographically convenient locations.

Pre-service and In-service Teaching Materials: Not reproduced or for sale or distribution at present.

PROJECT EVALUATED:

Yes _____ No _____ Internal X External Agency _____

Pertinent Research Studies: None

In-House or Unpublished Research: Not applicable

Availability of Evaluative Data: Not applicable

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

HEALTH ACTIVITIES PROJECT (HAP)

Lawrence Hall of Science
University of California
Berkeley, California 94720
U.S.A.
Telephone: (415) 642-3679

Director: Watson M. Laetsch
Project Duration: 1975-

Age: 10-13
Ability: all
Subject: health science
Language: English
Translations: none
Testing of Students:
lab performance tests, oral tests, teacher judgments

Materials Developed by Project:

Print	Non-Print
Activity Sheets Eval. Materials Newsletters	Lab Equipment

Types of Learning Experiences:
Lab Activities

PRINCIPAL PROFESSIONAL STAFF:

Dr. Herbert Thier, Associate Director
Dr. Robert Knott, Assistant Director

PROJECT HISTORY:

Principal Initiator(s): Dr. W. M. Laetsch
Dr. H. Thier

Reason(s) for Project Initiation: Need for interesting, flexible, and low cost activities to supplement health, science, and physical education programs and for modules which are health and science oriented.

Evolution and Development of the Project: HAP is supported by a grant from the Robert Wood Johnson Foundation to the Association of Science-Technology Centers (ASTC). Development of project is being conducted by the Lawrence Hall of Science.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop health and science oriented activities that allow young people to learn about their bodies and bring about changes in their bodies that result in healthier lives.

Specific Objectives: The Health Activities Project (HAP) is developing modules of activities for fifth-through eight-grade children in schools and community groups. These health activities are science based and student centered. Stusents measure their own performance as a source of evidence, learn about how their bodies function, how they can improve themselves, and how to make decisions regarding themselves. One objective is to help the individual develop and understand some of the scientific processes and concepts in human biology. An awareness that they have a considerable degree of control of their bodies will hopefully motivate children to consider how to change and improve themselves as they mature.

The HAP project started in April of 1975 and is currently developing modules concerned with (1) the concept of fitness, and (2) the way the individual interacts with and obtains information from the environment. HAP is not intended as a comprehensive curriculum, but will provide a wide variety of interesting, flexible, and low-cost activities. They can supplement health, science, and physical education programs and fit into other aspects of the classroom curriculum as well.

HAP activities may be used as integral parts of the health education programs of community organizations as well as the schools. The modules may also be used as a laboratory or investigative block during part of the year.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Grades 5 through 8 with wide spectrum in regard to socio-economic, cultural, and intellectual background.

Ways in which it differs from similar or previous programs:

1. Health activities are laboratory experiences.
2. It is not a health program.
3. Activities may be used with existing health programs.
4. Activities together may be used as health modules.
5. Kit equipment and folios for each activity allow for flexibility.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
I. How Do You Interact (Trial Module)	Not Purchasable Yet	HAP
A. Reaction Time		
B. Training Your Reaction Time		
C. Mask Relay		
D. Where Do I See		
E. Look, Listen, and Explore		
F. Where are You?		
G. Focusing on the Image		
H. Let's Manipulate		
II. Fitness (Trial Module)	Not Purchasable Yet	HAP
A. Exploring Heartbeats		
B. Exploring Pulse		
C. Pulse Recovery		
D. Jog-Walk		
E. Grip Strength		
F. Vital Capacity		
G. Breathing Rates		
H. Breath Recovery		
I. Breath Control		

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: Health Activities Project Newsletter

ADDITIONAL MATERIALS BEING DEVELOPED:

Other health/science related modules:

- Balance
- Digestion
- Temperature Control
- Growth
- Fatigue
- Structure
- Environmental Health
- Others

TEACHER PREPARATION:

Consultant Services: Trial Centers are being set up around the country. Leadership training persons are being trained at Lawrence Hall of Science. These people will train teachers in their own centers. Staff members will visit centers for feedback sessions and consultation with teachers.

Pre-service and In-service Training: Teacher training centers are being financed by school districts for published materials and equipment. Consultant services are financed from funding agency.

Pre-service and In-service Teaching Materials: Not available at this time.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

In-House or Unpublished Research: Formative evaluation of each activity has been ongoing with written and oral feedback from teachers plus staff observation of classes. Lapse-time photo evaluation has been analyzed for random classes. Over 100 students have been individually interviewed to compare HAP students with non-HAP students.

Availability of Evaluative Data: Not at present. Published papers will be available later.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE:

See list of possible future modules. Leadership training conference at Lawrence Hall of Science Fall, 1976. Trial nationwide during 1976-1977 academic year. Meanwhile new module development is continuing in Bay Area.

HIGH SCHOOL POLITICAL SCIENCE CURRICULUM PROJECT - COMPARING POLITICAL EXPERIENCES(CPE)

Social Studies Development Center
513 North Park Avenue
Bloomington, Indiana 47401
U.S.A.

Telephone: (812) 337-3838

Directors: Judith A. Gillespie, Howard D. Mehlinger, John J. Patrick

Project Duration: 1972-1979

Additional information, see also Clearinghouse Reports: 9

Age: 16-18
Ability: all
Subject: social sciences
Language: English
Translations: none
Testing of Students:
written achievement, oral, and standardized tests; teacher judgments, student attitude questionnaire, interest inventories

Materials Developed by Project:

Print
- Textbooks
- Supplementary Books
- Programmed Units
- Activity Sheets
- Tchr. Manuals
- Eval. Materials
- Behavioral Objectives
- Overview
- Newsletters
- Charts

Non-Print
- Slides
- Overhead Trans.
- Slide Tape
- Audiotape
- Games

Types of Learning Experiences:
- Discussion
- Lab Activities
- Field Experiences
- Simulations
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

Judith Gillespie, Howard Mehlinger and John Patrick are co-directors of the project. Judith Gillespie and John Patrick serve as principal developers for the Political Systems semester of the course. Judith Gillespie and Stuart Lazarus serve as principal developers of materials in the Political Issues semester of the course. David Lambert serves as evaluation coordinator for the project. Toby Bonwit serves as a developer and editor for the project. Bruce Smith, Lee Morganett and Martin Sampson are graduate assistants serving in administrative and development roles on the project.

PROJECT HISTORY:

Principal Initiator(s): The principal originators of the project were individuals involved in the American Political Science Association Committee on Pre-Collegiate Education and the staff of the Social Studies Development Center. The Chairman of the APSA Pre-Collegiate Committee is Richard C. Snyder whose work was fundamental in originating the proposal. The directors of the project also contributed to the development of the initial proposal from the Social Studies Development Center.

Reason(s) for Project Initiation: There were several reasons for initiating the project. First of all, the originators of the project saw the need for the development of an alternative for standard American government courses at the twelfth grade level. They aimed to provide students with competencies that had not, heretofore, been provided in the American government curriculum. They wanted students not only to have practical participation experience which would lead them to be more effective political actors in any arena of their choice.

A second reason for the initiation of the project was that the APSA Pre-Collegiate Committee desired to make a K-12 effort in political science education. The original proposal submitted to the National Science Foundation contained several proposed projects for a K-12 sequence. High School Political Science Curriculum Project was one part of a package that was designed as the principal thrust of the Pre-Collegiate Education Committee's efforts. The National Science Foundation was also prepared to fund a political science program. They had funded programs in other disciplines and up to the time of the origination of this program had not funded a program in political science.

PROJECT HISTORY: (continued)

Reason(s) for Project Initiation: (continued)

A third reason for initiating the project was that the staff of the Social Studies Development Center had developed a successful ninth grade American government program entitled American Political Behavior. They wanted to develop an alternative for the twelfth grade level which would be different from this alternative, as well as those existing in standard American government courses.

Evolution and Development of the Project: The project has been funded by the National Science Foundation since March, 1972. The grant is awarded to the American Political Science Association in Washington, D.C. A sub-grant is then awarded to the staff of the High School Political Science Curriculum Project at the Social Studies Development Center in Bloomington, Indiana. The vast bulk of the work of the project is done in Bloomington. There is a small subsidy provided for staff work at the Association headquarters in Washington, D.C.

The project began in March of 1972. The first year of the project was spent largely on conceptualization of the program and determining what it was we were going to do as far as curriculum development work. We developed position papers and talked with students, teachers and other professionals across the United States in an attempt to find needs and spread ideas as we were initiating the project. During the first year, as well as the second year of the project, we developed a set of prototype units. Ten units were tested in the schools in the 1973-74 school year. There were 23 schools used in this field test.

During the 1973-74 school year a semester of material was developed and tested in the schools. This constitutes the Political Systems semester of the course. The Political Systems semester was first field tested in 25 schools across the United States. During the 1974-75 school year the Political Systems semester of the course was revised and the Political Issues semester was developed, providing a full year course entitled Comparing Political Experiences. The two semesters are being field tested in 35 schools across the United States during the 1975-76 school year.

Comprehensive evaluation and critic reviews have been sought during the three years of field testing of the project. At the moment, we are preparing the final revised version of project materials for publication. We will be soliciting bids from publishers this spring, revising the course and preparing it for publication with a final copyright date of January, 1979.

PROJECT OBJECTIVES:

Overall Project Purpose: The overall purpose of the High School Political Science Curriculum project is to develop, test and disseminate an alternative course in American government for twelfth graders titled Comparing Political Experiences.

Specific Objectives: The overall substantive objective of the course is to promote the acquisition of knowledge, skills and participation experiences which will aid students in being more effective political actors. The specific objectives can be found on pages 21-27 of the book, Comparing Political Experiences, by Judith A. Gillespie and John J. Patrick. This book outlines the objectives and overall purpose of the program. Three general instructional objectives of the program are listed below:

1) Students should acquire useful knowledge in order to effectively interpret information and experiences;

2) Students should become proficient in basic intellectual skills in order to successfully analyze and evaluate information and experiences; and

3) Students should acquire participation skills and experiences in order to take effective roles in group contexts.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: The target population for which the course is intended is a general audience in grades 9-12. It should not be inappropriate for students of any socio-economic, cultural or intellectual background. On the other hand, it is not geared for non-readers and it is not specially geared for college bound students.

Ways in which it differs from similar or previous programs:

1. The project focuses on comparing political experiences across school, local, national and international levels.
2. The project focuses at the systems level as opposed to the individual level for exploring political phenomena and ideas.
3. The project utilizes the school as a laboratory for practical political participation experiences for students.
4. Students are exposed to participation experiences of a variety of types in school, community and work settings.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
The *Comparing Political Experiences* course consists of two semesters of material.	Free	CPE
The *Political Systems* semester consists of three units of materials: Observing Political Systems, Using Political Resources and Participating in Political Activities.	Free	CPE
The *Political Issues* semester consists of five units of material: A cartoon entitled Save the System! and four issue oriented units entitled, Busing in Boston, Clean Air Now, Jobs and Engines and Union Underground. The *Political Issues* course also contains a book called the *Political Issues Skills Kit*.	Free	CPE

PRESENT COMMERCIAL AFFILIATIONS:

We are seeking a publisher in the spring of 1976. Until the publisher is found, materials are available from the Social Studies Development Center, 513 North Park Avenue, Bloomington, Indiana 47401.

MATERIALS AVAILABLE FREE: See Materials Already Produced.

ADDITIONAL MATERIALS BEING DEVELOPED:

A teacher education package is in preparation. It will be developed and tested during the 1976-77 school year.

TEACHER PREPARATION:

Consultant Services: We are currently ending the pilot test phase of the project. Teachers will not be using our materials until they are published in January, 1979. We are available for consulting and giving presentations upon request where funds are available.

Pre-service and In-service Training: We do not know what these activities will be at this time. The teacher education package has not yet been designed.

Pre-service and In-service Teaching Materials: Science educators who are interested in pre-service and/or in-service teaching materials can request the unit materials as long as they are available. There is no charge for these materials.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency X

Name of Outside Evaluators: National Evaluation Systems

Pertinent Research Studies: None

In-House or Unpublished Research: Summaries of unit-by-unit evaluations and a final report will be available by the end of the summer, 1976. At the moment, we have write-ups of individual units and in-house material which we are using for formative evaluation.

Availability of Evaluative Data: Individuals may write and ask us for any of the tests or other evaluation forms that we are using. We cannot, at the moment, distribute evaluation results, but we can distribute all of the evaluation instruments that we are using to collect data. In the late summer and early fall of 1976 we will be able to distribute evaluation reports upon request. All individuals need do is write to us.

PROJECT PUBLICITY:

Judith A. Gillespie and Howard D. Mehlinger, "Teach About Politics in the 'Real' World -- The School," Social Education, Vol. 39, No. 6 (October, 1972), pp. 598-603, 644

Judith A. Gillespie, "Using the School as a Political Laboratory for Civics and Government Instruction," Minnesota Council for the Social Studies Journal (Fall, 1972), pp. 5-9.

Judith A. Gillespie, "Instructional Uses of School Political Experiences," Newsletter of the Social Science Education Consortium (November, 1972).

Howard Mehlinger, "Political Science," New York Times Education Supplement, (January 18, 1973).

Judith A. Gillespie and John J. Patrick, Comparing Political Experiences: An Alternative Program for High School Government Instruction, Washington, D.C.: American Political Science Association, 1974.

Judith A. Gillespie, "Pre-Collegiate Education News," DEA News, Vol. 1 (Winter, 1974).

Judith A. Gillespie, "Comparing Political Experiences: Reflection of Field Experiences," P.S. (Winter, 1974).

Howard D. Mehlinger, "Social Studies -- Yesterday, Today, and Tomorrow," Today's Education, Vol. 63, No. 2 (March/April, 1974), pp. 66-70.

Judith A. Gillespie, "Power and Participation in the Student Community." Paper delivered at the David W. Minar Memorial Conference, Northwestern University, Evanston, (October, 1974).

Judith A. Gillespie and Stuart Lazarus, "Political Issues: An Overview," High School Political Science Curriculum Project, Social Studies Development Center, January, 1975.

PROJECT ACTIVITIES SINCE 1974 REPORT:

We have not participated in this reporting activity before.

PLANS FOR THE FUTURE:

We are currently applying for the final year of funding from June, 1976 through June, 1977. During this period we will be revising materials for publication, obtaining a publisher and developing a teacher education package. Subsequent activities will include diffusion conferences and other dissemination work supported by the publisher.

HISTORY OF PHYSICS LABORATORY

Barnard College
Columbia University
New York, New York 10027

Telephone: (212) 280-5102

Director: Samuel Devons

Project Duration: 1968-1972, 1974-1977

Age: 16 +
Ability: not specified
Subject: phys, history of sci., history
Language: English
Translations: none
Testing of Students: Student Attitudes, Comprehension, Joy of Learning as expressed by students

Materials Developed by Project:

Print	Non-Print
Supplementary Books	Slides
Tchr. Manuals	Films
	Designs for Lab Equipment

Types of Learning Experiences:
- Lecture
- Seminar
- Discussion
- Independent Study
- Lab Activities
- Demonstrations
- Film

PRINCIPAL PROFESSIONAL STAFF: Collaboration with other institutions

PROJECT HISTORY:

Principal Initiator(s): Professor S. Devons

Evolution and Development of the Project:

1968-1972	N.S.F. Development Project. Development of Materials
1972	Sloan Foundation Grant for film
1972	N.S.F. Supported Summer Institute
1974-1977	N.S.F. Grant for Dissemination & Evaluation, Cooperation with 10/12 other college/university level institutions.

PROJECT OBJECTIVES:

The overall project purpose is to assist others who are interested in attempting a historical/experimental approach to science teaching, as a supplement to more conventional modes.

More specifically, the objectives are preparation of laboratory and historical materials addressed primarily to teachers, production of films whose purpose is to stimulate, enlighten and perhaps provide some pleasure and profit.

Present Phase: initiation of wider activity, which will enable some assessment to be made of feasibility, range of practicability, value, etc.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: students from grade 12 through graduate level

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
General Introductory Guide	Free	History of Phys.Lab
Detailed Historical, Scientific, Practical Notes on specific topics	Not Avail.	History of Phys.Lab
Film: Voltat Electricity	Not Given	Films for the...*
Articles on Particular Subjects	Some Avail. Free	History of Phys.Lab

PRESENT COMMERCIAL AFFILIATIONS:

*Films for the Humanities, Inc.
P. O. Box 2053
Princeton, N. J. 08540

HISTORY OF PHYSICS LABORATORY

MATERIALS AVAILABLE FREE:

General Introductory Guide - Limited number of copies available

Articles on Particular Subjects - Some reprints available

ADDITIONAL MATERIALS BEING DEVELOPED:

Additional films

Detailed Historical, Scientific, Practical Notes on specific topics is intended for publication later

TEACHER PREPARATION:

Consultant Services: At present, limited to the group of participants cooperating in the project.

Pre-service and In-service Training: Periodical meetings of participating group.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

PROJECT PUBLICITY:

1. A History of Physics Laboratory. Physics Today 23, 44 (1970)
2. A Pilot Experience in Teaching a History of Physics Laboratory, American Journal of Physics, L. Hartmann, 39, 924 (1971)
3. Understanding Physics Through Its History. Proceedings of Royal Society of Edinburgh (A) 70, 95, (1972)
4. Review of Film, "Voltat Electricity" American Journal of Physics, 43, 659, July 1975.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Not answered

PLANS FOR THE FUTURE:

Not answered

HUMAN BEHAVIOR CURRICULUM PROJECT FOR SECONDARY SCHOOLS (HBCP)

Carleton College
Northfield, Minnesota 55057
Telephone: (507) 645-6996

Director: John K. Bare
Project Duration: 1974-1977

Age: 16-18
Ability: average
Subject: human behavior
Language: English
Translations: none
Testing of Students:
written achievement tests
teacher judgments

Materials Developed by Project:

Print
- Tchr. Manuals
- Eval. Materials
- Behavioral Objectives
- Overview
- Newsletters
- Charts
- Student Booklets

Non-Print
- Slides
- Films
- Audiotape
- Games

Types of Learning Experiences:
- Lecture
- Seminar
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Demonstrations
- Simulations

PRINCIPAL PROFESSIONAL STAFF:

John K. Bare, Director
Robert S. McCargar, Associate Director for Evaluation
Tom Lo Guidice, Development Associate

PROJECT HISTORY:

Principal Initiator(s): John K. Bare and the American Psychological Association.

Reason(s) for Project Initiation: To provide teachers with a wider selection of materials, produced in a form that they will find most useful. At the same time to give the students a contemporary, sound, representation of our knowledge of human behavior.

Evolution and Development of the Project:

December 1967 - APA Precollege Planning Session, Williamsburg, Virginia.

December 1969 - Policy statement favoring precollege curriculum development. Statement adopted by Education and Training Board, the Board of Directors, and the Council of Representatives of the APA.

1970 - First edition of source book for high school teachers produced by participants of a five-week project at Oberlin College. The project prompted the establishment of a Clearinghouse on Precollege Psychology in APA's Central Office.

August 1972 - John K. Bare, Professor of Psychology at Carleton College, appointed by the APA Board of Directors to direct a proposed curriculum project.

February 21, 1972 - Proposal submitted to the National Science Foundation. After review and modification, the Human Behavior Curriculum Project for Secondary Schools was funded for a period from January 1, 1974 to December 31, 1974. The initial grant was later amended to encompass the period from January 1, 1975 to June 30, 1976.

July 1, 1975 - Grant reduced to support ten of original thirty modules. Expected funding period will cover period from July 1, 1976 to September 1, 1977.

PROJECT OBJECTIVES:

Overall Project Purpose: To improve the quality of instruction in human behavior in the secondary school.

Specific Objectives: To develop, validate and disseminate ten modules in human behavior.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students with range of ability found in grades 10-12 (ages 16-18), with greatest use at 12th grade level in a variety of socio-economic backgrounds.

Ways in which it differs from similar or previous programs: The level of analysis which this project focuses on is its most distinctive feature. The subject matter under study is individual behavior, its origins and its development. Wherever possible, the resources of all of the disciplines (biology, sociology, psychology, anthropology) will be brought to bear on topics.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: None

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

Ten modules, each covering two to three weeks of instruction with the following titles:
"Theories of Personality"
"Brain and Behavior"
"Computer and the Human Brain"
"States of Consciousness"
"Conditioning and Learning"
"Natural Behaviors in Animals and Humans"
"Organizational Psychology"
"Changing Attitudes and Beliefs"
"Social Influences on Judgments and Decisions"
"Language, Communication, and Thought"

TEACHER PREPARATION:

Consultant Services: Modules are designed to be self-contained. Specifically, a teacher handbook is developed to give teachers suggestions on content and instruction strategies.

PROJECT EVALUATED:

Yes ____ No _X_ Internal ____ External Agency ____

Availability of Evaluative Data: Evaluation will be available on the completion of the materials. Write American Psychological Association, 1200 Seventeenth Street, N.W., Washington, D.C. 20036 after September 1, 1977.

PROJECT PUBLICITY:

APA *Monitor*	*Human Behavior*
Education News Notes	*New York Times*
Science	New Jersey Council for the Social Studies *Bulletin*
Montreal *Gazette*	

PROJECT ACTIVITIES SINCE 1974 REPORT: Continuation of development of materials.

PLANS FOR THE FUTURE:

Conduct local and national trials for ten modules and ready them for a publisher by September 1, 1977.

HUMANISTIC APPROACH TO NATURAL SCIENCE (HANS) AND ELEMENTARY SCIENCE TEACHER TRAINING (ESTT)

Department of Science Education
32 Washington Place, Room 23
New York, New York 10003
U.S.A.
Telephone: (212) 598-2131

Director: James V. Connor

Project Duration: 1968-1977

Additional information, see also Clearinghouse Reports: 9, 8

Age: 18-20
Ability: average
Subject: biol, chem, phys, earth-space, humanities
Language: English, Spanish
Translations: none
Testing of Students: written achievement, lab performance and oral tests; teacher judgments, student attitude questionnaire

Materials Developed by Project:

Print	Non-Print
Textbooks	Audiotape
Lab Books	
Programmed Units	
Activity Sheets	
Tchr. Manuals	
Behavioral Objectives	
Overview	

Types of Learning Experiences:

Lecture
Seminar
Discussion
Independent Study
Lab Activities
Field Experiences
Demonstrations
Audio/Visual

PRINCIPAL PROFESSIONAL STAFF: Not answered

PROJECT HISTORY:

Principal Initiator(s): James V. Connor

Reason(s) for Project Initiation: To develop a science course for elementary teachers that would relate science to the humanities.

Evolution and Development of the Project: The Project began at Allentown College and spread locally to the ten colleges of the Lehigh Valley Association of Independent Colleges and the Lehigh Regional Consortium. It is currently being tested in trial form there before being made available nationally.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop a two-to-four semester course in science that would emphasize the humanistic interrelations of science and society as well as the method and content of newly developed programs in the United States and Great Britain for elementary school science. Thest would include such projects as COPES, ESS, SAPA, SCIS, NUFFIELD JUNIOR SCIENCE and SCIENCE 5/13. To develop an interdisciplinary course in science for the liberal arts major.

Specific Objectives: To develop a course that would be relevant, interesting, challenging and concerned with the main concepts and processes of science. To provide elementary teachers with the science content and methods that would allow any of the newly developed programs to be inexpensively and easily implemented.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: College undergraduates and future teachers of average intelligence from any cultural, intellectual or socio-economic background.

Ways in which it differs from similar or previous programs: As a course for nonscientists at the college level, the scientific concepts are placed in an historical framework so that they can be developed without other science course prerequisites. Laboratory work is stressed and part of this content is drawn from the newer elementary programs and so placed that this inquiry is done and discussed before being treated in class. The program is humanistic in approach in that it focuses on the major figures in science as individuals and emphasizes the interconnection of science and the humanities.

HANS & ESTT (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Text: Physical Science (Part I) - Trial	$5.00	HANS & ESTT
Lab Exercises: Physical Science Labs (Part I) - Trial	5.00	HANS & ESTT
Programmed Labs: Physical Science Labs (Part I)-Trial	5.00	HANS & ESTT

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: Outline of text and outline of labs.

ADDITIONAL MATERIALS BEING DEVELOPED:

Text: Life Science (Part II)
Lab Exercises: Life Science Labs (Part II)
Programmed Labs: Life Science Labs (Part II)

TEACHER PREPARATION:

Consultant Services: Consultation to directors and teachers available all year.

Pre-service and In-service Training: Workshops - pre-service and in-service; Cost: Consultant Fee.

Pre-service and In-service Teaching Materials: Text, labs, programmed labs.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency X

Name of Outside Evaluators: National Science Foundation; Lehigh University; and Teachers College, Columbia University.

Pertinent Research Studies: Connor, J. V. 1974. Development and Evaluation of a College Text: A Humanistic Approach to Physical Science, ERIC: Columbia University Teachers College Doctoral thesis.

In-House or Unpublished Research: UNESCO: Report on U. of Md. ICSU Conference of April 1973 "A Humanistic Approach to Elementary Science Teacher Training."

Availability of Evaluative Data: In process

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Further trial testing at New York University.

PLANS FOR THE FUTURE: Trial testing of life science materials (Part II), Text and Labs.

INDIVIDUALIZED INSTRUCTION IN MATHEMATICS

137 Abbott Avenue
Ocean Grove, New Jersey 07756
U.S.A.

Telephone: (201) 776-5767

Director: Mervine Edwards

Project Duration: 1969-1975

Additional information: see also the 20-Year Cumulative Directory for title change.

Age: 13-18
Ability: all
Subject: math
Language: English
Translations: none
Testing of Students:
- written achievement tests
- standardized tests
- interest inventories

Materials Developed by Project:

Print	Non-Print
Textbooks	Videotape
Eval. Materials	Audiotape
Behavioral Objectives	
Overview of Project	

Types of Learning Experiences:
- Lab Activities
- Televised Lessons

PRINCIPAL PROFESSIONAL STAFF:

Current teachers of our 35 sections: Phyllis Soldey, Bob Rolak, Joe Bendock, Helene Goodman, Bob Gilanyi, Lyndley Robinson, Judy Holmes, Clarence Clayton.

PROJECT HISTORY:

Principal Initiator(s): Mervine Edwards

Reason(s) for Project Initiation: to enable a larger percent of students to find success in mathematics.

Evolution and Development of the Project:

1. Algebra I first developed in 1969, tape cassette for each lesson, piloted on small group of seven.
2. Expanded to one class in 1970.
3. All Algebra I in 1971; one in Algebra II.
4. Discovery that 45 minute tapes were not necessary for each lesson; students could get subject if reading level was no higher than 5th grade.
5. 100 lessons in Algebra I and 100 in Algebra II were rewritten and shortened. Short 10 minute tapes were produced only as remedial for the 15-20 hardest lessons.
6. Course content expanded to Geometry, Analysis, General Math.
7. By September 1974 all math students under individualized instruction.
8. We had indications that some students preferred traditional group instruction.
9. In September 1975 we permitted students to select mode of instruction, group or individual.
10. For past 2 years about 825 have selected individualized instruction each year. Only 60-75 prefer group instruction. Over 90%, with parent written approval, have chosen and stayed with individualized mode.

PROJECT OBJECTIVES:

Overall Project Purpose: To provide a mathematics curriculum that will meet the needs and ability levels of the vast majority of students.

Specific Objectives:

1. To give opportunity to learn mathematics to students who normally experienced failure due to apparent deficiency in basic skills. We have found that students with only 5th grade reading or arithmetic levels can do Algebra successfully if reading level of material is only 5th grade; yet math level is legitimate high school level.

INDIVIDUALIZED INSTRUCTION IN MATHEMATICS (2)

PROJECT OBJECTIVES: (continued)

Specific Objectives: (continued)

2. To permit above average students to accelerate or explore the more challenging areas of mathematics without being bored waiting for the rest of the class to understand material.
3. To lead majority of college bound students to want to take Algebra I, Algebra II, Geometry and Trigonometry. The percent of students who now go this far has increased dramatically from what it was when we had only group instruction; from 50% to 67%.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: total population of grades 8-12 (ages 12 - adult).

Ways in which it differs from similar or previous programs:

1. Not dependent upon need for expensive equipment. Aside from textbooks, a classroom could be used for seven classes a day of 24 students each, with need for only the following:

3 $40.00 tape recorders (with headsets)	$120.00
3 3-sets of 15 remedial tapes	45.00
Total	$165.00

Thus, the cost of audio visual equipment is less than $25.00 per classroom.

2. Students are tested at end of each lesson. They cannot go on until errors are corrected; they are retested if they achieve less than 80% on a quiz.
3. Three question reviews are given at end of every other lesson; so cycled that all prior material of course is reviewed by end of every 6th lesson.
4. Students are not permitted to stall. In any marking period students must complete a minimum of 1/2 of required lessons or be given an "F" regardless of average. Failure rate is about 4%.
5. Teachers do not grade quizzes during class. This is done in free period. The average teacher does about one hour grading a day outside of his or her five classes.
6. Classes are totally heterogeneous and include Algebra, Geometry, Trigonometry, and General Mathematics.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Algebra I Text	Not given	Holt, Rinehart & Winston
Algebra II Text		Holt, Rinehart & Winston
Geometry Text		Indiv. Instr. in Math
Trigonometry Text		"
General Math Text		"
15 Remedial Cassette-Booklet lessons in Algebra I		"
20 Remedial Cassette-Booklet lessons in Algebra II		"
Two versions of quiz for each of 100 lessons in each course (on spirit masters)		Holt, Rinehart & Winston
Chapter, marking period, final tests (3 forms) for each course (on spirit masters)		Holt, Rinehart & Winston
Six page description in detail of entire program	$1.00 + stamped 9x12 env.	Indiv. Instr. in Math

PRESENT COMMERCIAL AFFILIATIONS:

Holt, Rinehart, and Winston, Inc.
Division of CBS
383 Madison Avenue
New York, New York 10017

Date of latest edition: 1974

MATERIALS AVAILABLE FREE: See MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS

ADDITIONAL MATERIALS BEING DEVELOPED:

10 minute cassette color T.V. tapes for remedial use in Algebra I and II.

TEACHER PREPARATION:

Consultant Services: Workshops have been given to over 100 school districts and at some NCTM meetings. Consultant available on a limited basis.

Pre-service and In-service Training: Cost of workshops: Consultant expenses only, $100.00 per day plus transportation, lodging and meal expenses.

Pre-service and In-service Materials: 6 page typed booklet described under MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS.

PROJECT EVALUATED:

Yes X   No _____   Internal X   External Agency _____

In-House or Unpublished Research: Administration of Educational Testing Service Cooperative Tests in Algebra I and II gives encouraging results. Over 2/3 of students score above average on these tests.

Availability of Evaluative Data: By written request to project.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT:

Text materials completed for the courses in Geometry, Trig(Analysis) and General Math.

We have devised a review system so that students completing a course begun the previous year can, when coming back in September, quickly recall old material; the review usually takes at most 3-4 weeks. We now provide enrichment material for the bright student so that he can not only accelerate but also probe more deeply the ideas of Mathematics. Originally we thought that the cassette tapes were an integral part of the success of the program. We discovered that the majority of students were able to read the booklets without listening to the tapes.

We realize that not all students profit from the same type of learning experience. Two years ago we offered students the option of selecting either individualized or group instruction.

PLANS FOR THE FUTURE:

We have been developing lessons in APPLICATIONS of Algebra to the areas of Consumer, Career, and Science Mathematics. The entire package of APPLICATIONS for Algebra I and II will be completed by June of this year, 1976.

INDIVIDUALIZED SCIENCE (IS)

Learning Research and Development Center
3939 O'Hara Street
Pittsburgh, Pennsylvania 15260
U.S.A.

Telephone: (412) 624-4820/4821

Directors: Audrey B. Champagne,
Leo E. Klopfer

Project Duration: 1964-1976

Additional information, see also Clearinghouse Reports: 9, 8 and the 20 Year Cumulative Directory for title change.

Age: 5-14
Ability: all
Subject: biol, chem, phys
Language: English
Translations: none
Testing of Students:
written and performance assessments for attainment of specified competencies

Materials Developed by Project:

Print
- Teaching Units
- Tchr. Manuals
- Tchr. Preparation Units
- Brochures
- Activity Sheets
- Eval. Materials
- Behavioral Objectives
- Investigation Booklets
- Lesson Booklets
- Reading Selections
- Planning Booklets
- Seminar Guide Booklets

Non-Print
- Filmstrips
- Audiotape
- Games
- Student Kits

Types of Learning Experiences:
- Seminar
- Discussion
- Independent Study
- Lab Activities
- Audio/Visual
- Self-Instructional Lessons
- Inquiry Type Investigations
- Science Learning Games

PRINCIPAL PROFESSIONAL STAFF: Not Answered.

PROJECT HISTORY:

Principal Initiator(s): R. Glaser and W. Cooley.

Reason(s) for Project Initiation: To develop an individualized elementary school science program.

Evolution and Development of the Project: Project has developed an individualized elementary science program for grades K-6, and this has been published.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop an individualized elementary school science program.

Specific Objectives:

1. Inquiry Goal: The student becomes skillful in using the processes of scientific inquiry and is able to carry out inquiries.
2. Scientific Literacy Goal: The student acquires a foundation for scientific literacy.
3. Affective Goal: The student displays informed attitudes toward his study of science, scientific inquiry, and the scientific enterprise.
4. Student Self-Direction Goal: The student views the learning process as primarily self-directed and self-initiated.
5. Student Co-Evaluation Goal: The student plays a major role in evaluating the quality, extent, and rapidity of his learning.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students in grades K-8 of all socio-economic, cultural and intellectual backgrounds.

Ways in which it differs from similar or previous programs: The IS model of individualization adapts the learning environment to these student characteristics:

intelligence, acquired knowledge, cognitive development, cognitive style, interests and attitudes.

In the IS program, the following dimensions of the learning environment are adapted to individual differences:

learning goals, instructional materials, instructional units, learning setting, teaching focus, instructional mode, instructional strategy, responsibility for evaluation and decision-making.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Teaching Units:	not given	Imperial International Learning Corp.
Introductory Units:		
Start		
Launch		
Mainstream Units:		
Level A		
Simpson (Sorting)		
Galileo (Observing)		
Michelson (Measuring)		
Level B		
Burbank (Classifying)		
Hooke (Forces)		
Curie (Physical States)		
Level C		
Lagrange (Metric Measurement)		
Vesalius (Systems)		
Black (Chemical Systems)		
Level D		
Lavoisier (Burning)		
Dalton (Atoms and Molecules)		
Haldane (Breathing)		
Level E		
Joule (Energy)		
Beaumont (Digestion)		
Voit (Nutrition)		
Teacher's Manuals Level A through Level E	$7.00 per level	Imperial International Learning Corp.
Teacher Preparation Unit (no charge if two levels of program are purchased)	$110.00	
Individualized Science Brochures	Free	Imperial International Learning Corp.
Sound Filmstrips: "A Moment With Individualized Science" "A Typical Day in Individualized Science"	available for loan	Imperial International Learning Corp.

PRESENT COMMERCIAL AFFILIATIONS:

Imperial International Learning Corp.
Box 548
Kankakee, Illinois 60901

MATERIALS AVAILABLE FREE:

Individualized Science Brochures
Sound Filmstrips: "A Moment With Individualized Science" (Loan)
"A Typical Day in Individualized Science (Loan)

ADDITIONAL MATERIALS BEING DEVELOPED:

Mainstream Units:

Level F
Harvey (Circulation)
Powell (Water)

Alternative Pathway Units:

Comstock (Plants and Animals)
Linnaeus (Plant Growth)
Volta (Electricity)
Archimedes (Machine)
Copernicus (Solar System)
Lyell (Geology)

Mainstream units comprise the basic science core which each student is expected to study. Alternative Pathway units are optional explorations which are available to the student.

TEACHER PREPARATION:

Consultant Services: Research for Better Schools Inc. provides consultant services for IS demonstration schools network.

Pre-service and In-service Teaching Materials: Teacher Preparation Unit, A short (8-12 hour) course designed to familiarize teachers with individualization model and program goals and components.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency X

Name of Outside Evaluator: Research for Better Schools, Inc.

Pertinent Research Studies:

A Report on Sex/Race Bias in Levels A through E of Individualized Science. Aug 1973. Research for Better Schools.
Individualized Science and Students' Attitudes Toward School and Science. Aug 1973. Research for Better Schools.
"Formative Evaluation of the Individualized Science Program," Studies in Educational Evaluation, Issue No. 2, 1975.

Availability of Evaluative Data: A bibliography of papers published by Learning Research and Development Center on Individualized Science may be obtained from project headquarters.

PROJECT PUBLICITY:

Champagne, Audrey B. and Leo E. Klopfer, "Ascertaining the Value of a Science Program," Science and Children, Vol. 13, 1975.
Champagne, Audrey B. and Leo E. Klopfer, "Formative Evaluation in Science Curriculum Development," Journal of Research in Science Teaching, Vol. 11, Pp, 185-203, 1974.

PROJECT PUBLICITY: (continued)

Champagne, Audrey B. and Leo E. Klopfer, "An Individualized Elementary-School Science Program," Theory Into Practice, April 1974, Vol. 13, Pp. 136-148.

Klasey, Jack, "Happening at St. Stephen Protomartyr School," Today's Catholic Teacher, March 1974. Vol. 7, No. 6, Pp. 28-30.

McLeod, Carmen E., and Joanne B. Stolte, "Individualized Science -- Just South of Capitol Hill," Science and Children, April 1975, Vol. 12, No. 7, p. 20.

Zeitler, William R., "Curriculum Reviews: Individualized Science," Science and Children, February 1975, Vol. 12, No. 5, Pp. 32-33.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Fifth level of program published in 1975. Development and formative evaluation on remaining units is being carried out. Current development efforts are focused on the refinement of instructional modules for grades 7 and 8 to enhance the student's inquiry skills and problem-solving ability.

PLANS FOR THE FUTURE:

Writing will be completed by 1976.

INDIVIDUALIZED SCIENCE INSTRUCTIONAL SYSTEM (ISIS)

415 North Monroe Street
Johnston Building, Room 415
Tallahassee, Florida 32301
U.S.A.

Telephone: (904) 644-2864/2865

Director: Ernest Burkman

Project Duration: 1972-1980

Additional Information, see also Clearinghouse Reports: 9

Age: 14-18
Ability: average
Subject: biol, chem, phys, earth-space
Language: English
Translations: none
Testing of Students: class tests, individually scheduled student tests

Materials Developed by Project:

Print	Non-Print
Textbooks	Audiotape
Tchr. Manuals	Games
Eval. Materials	
Newsletters	
Programmed Units	

Types of Learning Experiences:
- Independent Study
- Discussion
- Lab Activities
- Field Experiences
- Simulations
- Audio-Visual

PRINCIPAL PROFESSIONAL STAFF:

Ernest Burkman, Director
David D. Redfield, Associate Director
William R. Snyder, Assistant Director

PROJECT HISTORY:

Principal Initiator(s): Ernest Burkman, David Redfield, William Snyder

Evolution and Development of the Project: The National Science Foundation sponsored a meeting of science teachers and scientists at Callaway Gardens, Georgia in October 1971. These specialists recommended the development of alternative curricular materials that focus upon individualized instruction. Shortly after this conference, a proposal was made to the National Science Foundation to support an effort to implement the conference's recommendations.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop alternative curriculum materials that focus upon individualized instruction; that strike a balance between theoretical and applied science; that place considerable emphasis upon social implications and that emphasize measurable objectives without losing sight of the affective dimensions of learning.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: High school science students.

Ways in which it differs from similar or previous programs: Materials are 3-4 week minicourses.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Newsletters 1-4	Free	ISIS
Commercial Brochure	Free	Ginn
Minicourses scheduled for publication during 1976	unknown	Ginn
Heart Attack - Biology		
Snakes and Other Critters - Biology		
Food and Microorganisms - Biology		
Getting Enough Oxygen - Biology		
Gut Reactions - Biology		
Generation Link - Biology		
Know the Bug - Biology		

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material	Cost	Source
Minicourses scheduled for publication during 1976 (continued) Sounds of Music - Physics/Biology Packaging Passengers - Physics Using the Skies - Earth Science/Astronomy Stormy Weather - Earth Science/Meteorology Ways We Learn - Multidisciplinary Plants Indoors - Biology Household Energy - Physics Buying and Selling - Multidisciplinary	unknown	Ginn

PRESENT COMMERCIAL AFFILIATIONS:

Ginn and Company
191 Spring Street
Lexington, Massachusetts 02173

MATERIALS AVAILABLE FREE: Newsletters

ADDITIONAL MATERIALS BEING DEVELOPED:

Trial minicourses which will eventually be available commercially

TEACHER PREPARATION:

Consultant Services: Regional consultants list available upon request.

Pre-service and In-service Training: Commercially sponsored workshops only by Ginn and Company.

Pre-service and In-service Teaching Materials: None at present.

PROJECT EVALUATED: Not Answered

PROJECT PUBLICITY:

Burkman, E. Feb. 1972. New Directions for the High School Science Program. The Science Teacher. 39(2): 42-44.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not Answered.

PLANS FOR THE FUTURE: Not Answered.

INTEGRATED SEQUENCE FOR HIGH SCHOOL MATHEMATICS

Bureau of Mathematics
State Education Department
Albany, New York 12234
U.S.A.

Telephone: (518) 474-3900

Director: Fredric Paul

Project Duration: 1972-

Age: 13-17
Ability: average and above average
Subject: math
Language: English
Translations: none
Testing of Students: written achievement tests, teacher judgments

Materials Developed by Project:

Print	Non-Print
Activity Sheets Tchr. Manuals Eval. Materials Overview	None

Types of Learning Experiences: Varies depending on individual school and teacher.

PRINCIPAL PROFESSIONAL STAFF: Not answered

PROJECT HISTORY:

Principal Initiator(s): Bureau of Mathematics (ad hoc committee)

Reason(s) for Project Initiation: To present a three-year sequence in mathematics incorporating all aspects from a practical, integrated point of view for the average high school student.

Evolution and Development of the Project:

1. Outline proposed by committee
2. Course developed by two writers in the form of teacher handbooks - a three-year curriculum
3. Thirty-eight school districts of all types chosen to teach courses.
4. Presently, course is being taught for the second time and will be revised at the end of 1976.
5. Course III will be taught in 1977.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop a three-year mathematics program which presents algebra, geometry, trigonometry, probability and logic in a practical, integrated format adaptable to all levels of ability for high school students.

Specific Objectives:

1. Eliminate the sandwich (algebra-geometry-algebra) effect;
2. Emphasize the consumer and career aspects of mathematics;
3. Encourage more students to take more mathematics;
4. Logically proceed from the non-formal, non-proof approach to a more rigorous approach; and
5. Incorporate logic and probability into the main stream.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Entire range of students in grades 9-11.

Ways in which it differs from similar or previous programs: We believe the only projects with similar concepts have been developed for the upper ability students and have involved very advanced mathematics. This is aimed at the average student and has the potential of being applicable to all ability levels with proper modifications either way.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Thus far we have produced an outline and teacher booklets for each of the three courses. Various teachers have produced some supportive materials such as groups of exercises. No single text covers the content of the courses.	Limited Copies Free	Project Director

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE:

All materials are free but result from rapid copy; therefore supplies are very limited at present.

ADDITIONAL MATERIALS BEING DEVELOPED:

Upon revision of courses they will be put into printed form and made available through the State Education Department.

TEACHER PREPARATION:

Consultant Services: Thus far the program is limited to the 38 participating project systems.

Pre-service and In-service Training: Area meetings with teachers in the project are held regularly with no cost involved.

PROJECT EVALUATED:

Yes _____ No X Internal _____ External Agency _____

PROJECT PUBLICITY:

Nothing official as yet. Reference has been made in AM & NYS Journal (New York State) and several presentations on it have been made at National Council of Teachers of Mathematics (NCTM) meetings.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE:

If all goes well this could become an alternative reference for use in New York State high schools.

INTENSIVE MODULAR SHORT COURSES IN CHEMISTRY

Department of Chemistry
Colorado State University
Fort Collins, Colorado 80523
U.S.A.

Telephone: (303) 491-5391

Directors: Robert A. Osteryoung
Rodney K. Skogerboe

Project Duration: 1973-1976

Age: adult
Ability: average, above average
Subject: chemistry
Language: English
Translations: none
Testing of Students: student attitude q're

Materials Developed by Project:

Print	Non-Print
Bibliography	Slides
Lab Experiments	
Articles	
Supplementary Notes	

Types of Learning Experiences:
- Lecture
- Lab Activities

PRINCIPAL PROFESSIONAL STAFF:

Dr. Anthony P. Schmitt, Senior Research Associate. A script is prepared for the module under the direction of the lecturer. Slides are then laid out and their production by a secretary and technician is supervised.

PROJECT HISTORY:

Principal Initiator(s): Drs. Robert A. Osteryoung and Rodney K. Skogerboe

Reason(s) for Project Initiation: To provide materials for non-chemistry students who need a knowledge of areas of chemistry in their own disciplines.

Evolution and Development of the Project: As first planned the modules were to be very theory oriented. Before the first module was produced however, this approach was thought to be inappropriate. It was then decided to make the modules as applications oriented as possible. After a few of the modules were given, it was found that most could be improved by incorporating one or more laboratory sessions to give participants hands-on-experience.

PROJECT OBJECTIVES:

Overall Project Purpose: To remedy a problem existing at the graduate level in areas outside of chemistry which have a "high content" in a number of areas of chemistry, a series of modular short courses in a number of areas of chemistry are being developed. These courses are designed primarily to meet the needs of non-chemistry graduate students or technicians who make use of the principles, practices and instruments associated with chemistry as a core discipline. The program also has been found to be beneficial to both university faculty and technicians who again make use of the methodology of chemistry in carrying out their work in non-chemical areas.

Specific Objectives: To develop a series of modular short courses as a service to non-chemistry graduate students, technicians and scientists who make use of the principles, practices and instruments associated with chemistry as a core discipline. To enable these persons to better carry out their work in non-chemical areas.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: University: Non-chemistry graduate students, technicians and faculty; Non-university: Scientists and technicians.

Ways in which it differs from similar or previous programs: In general, chemistry departments do not make an effort to provide "service" courses for non-chemistry graduate students whose interest in chemistry may be very narrow - for instance, related to a desire to make use of a particular instrument or analytical procedure. The concept itself, we feel, is innovative; providing a specialized, and even limited, service in the instructional area for non-chemistry graduate students in a variety of research areas, non-chemical in nature, which do, however, utilize a good amount of chemistry, is itself unique. The second unique feature of the

UNIQUE CHARACTERISTICS OF THE PROJECT: (continued)

Ways in which it differs from similar or previous programs: (continued)

program is its attempt to combine the best features of the lecture method of instruction - having a live expert in the field presenting the material and being present to interact with the student, and the audio-tutorial method of instruction - the presentation of good audio-visual materials; with the student having a personal copy of these materials.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Slides and Short Course Manuals have been prepared for the following short courses: "Chemistry of Some Pesticides," "Physical Chemistry of Surfaces," "Water Chemistry," "Standard Methods of Water Analysis," "Paper and Thin Layer Chromatography and Electrophoresis," "Principles and Practice of Gas Chromatography," "Introduction to Electrochemical Analysis," "Ion Selective Electrodes," Trace Analysis by Stripping Voltammetry," "Trace Metal Analysis by Atomic Absorption Spectroscopy," and "Optical Emission Spectroscopy."	Small Charge for Printing and Handling (Limited Basis)	Project Directors

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

Slides and Short Course Manuals are planned or are being developed for the following short courses: "Modern Techniques for the Design and Interpretation of Chemical Experiments," "Liquid and Gel Permeation Chromatography," "Solvent Extraction and Ion Exchange," and "Pulse Polarography."

TEACHER PREPARATION: None

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Availability of Evaluative Data: Write to Project Directors

PROJECT PUBLICITY: None

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE: Complete short courses

INTERRELATED EXPLORATIONS IN SCIENCE (IES)

P. K. Yonge Laboratory School
College of Education
University of Florida
Gainesville, Florida 32611
U.S.A.

Telephone: (904) 392-1526

Director: Nancy C. Griffin

Project Duration: 1972-1975

Additional Information: See Also Clearinghouse Report 9

Age: 11-13
Ability: all
Subject: bio, chem, phys, earth-space
Language: English
Translations: none
Testing of Students:
- lab performance tests
- oral tests
- teacher judgments

Materials Developed by Project:

Print	Non-Print
Activity Sheets	Games
Tchr. Manuals	Models
Eval. Materials	Lab Equipment
Behavioral Objectives	
Overview of Project	

Types of Learning Experiences:
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Demonstrations
- Simulations
- Audio/Visual
- Games
- Dramatizations

PRINCIPAL PROFESSIONAL STAFF:

Consultants and Assistants for IES projects:

Mrs. Virginia Allen
Dr. Paul Becht
Dr. Tom Gadsden
Ms. Susan Poor

PROJECT HISTORY:

Principal Initiator(s): Nancy C. Griffin

Reason(s) for Project Initiation: We saw a need for this type of program within our personal classes. School director encouraged the working of project.

Evolution and Development of the Project:

1. Materials pilot tested at P. K. Yonge, then revised.
2. Florida Educational Research and Development Council funded field testing with the state (approximately 1,000 students, 10 teachers, 4 schools).
3. Materials revised from field testing.
4. Materials made available to more schools after one year of testing - for further analysis.
5. Materials are being considered for publication - currently.

PROJECT OBJECTIVES:

Overall Project Purpose:

1. to make learning of science an enjoyable process.
2. to involve students as much as possible through active participation.
3. to relate science to our every day life and thus foster better appreciation of the natural world.
4. to develop knowledge of the principles and concepts of science.
5. to use materials that are simple in design and low in cost.
6. to understand relationships that tie together many fields of science.

Specific Objectives:

1. to learn how to measure through practicing various techniques in measuring.
2. to describe order in biological and molecular systems, structure, interrelationships and responses.
3. to observe and survey change.
4. to identify the balancing forces of the universe, earth, populations and individuals.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: General - Our testing indicates it is suitable for students in grades 6-8 of all intellectual backgrounds with the exception of mentally handicapped students. No distinctions in suitability for differing socio-economic or cultural groups were found. Suitable for typical 6th through 8th grade population.

Ways in which it differs from similar or previous programs: This is almost totally an activity oriented program where students work individually in small groups and large groups and are responsible for their own learning. The program requires a student to involve himself on three levels including: skill development, laboratory experiments and problem-solving.

Much of the program centers around a student involving his own body in order to learn a concept.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Overview dealing with philosophy, program organization and content	Free	P. K. Yonge[1]
Complete programs for each grade level grades 6-8 including:	$30.00 per grade level	P. K. Yonge
Student activity sheets - the basic materials of the program		
Checkpoints - short tests for students		
Games and gimicks - materials through which students learn a single idea or principle		
Behavioral objectives for each section		
Specific objectives for each student activity		
Research monograph, describing program, its testing in the state of Florida and specific findings	Free	P. K. Yonge

[1] Florida Educational Research and Development Council
c/o Nancy Griffin
P. K. Yonge Laboratory School
College of Education
University of Florida
Gainesville, Florida 32611

PRESENT COMMERCIAL AFFILIATIONS:

Nothing commercial to date, however, materials may be purchased at cost of duplication through Florida Educational Research and Development Council, c/o Nancy Griffin, P. K. Yonge Laboratory School, College of Education, University of Florida, Gainesville, Florida 32611.

MATERIALS AVAILABLE FREE:

- Overview dealing with philosophy, program organization and content
- Research monograph, describing program, its testing in the state of Florida and specific findings
- Samples from -
  - Student activity sheets
  - Checkpoints
  - Games and Gimicks
  - Behavioral objectives for each section
  - Specific objectives for each student activity

ADDITIONAL MATERIALS BEING DEVELOPED: None at this time.

TEACHER PREPARATION:

Consultant Services:

1. Workshop on philosophy and use of Interrelated Explorations in Science
2. Workshop on writing and practice in writing activity oriented materials for students grades 2-8.

Pre-service and In-service Training: Pre-Service and In-Service workshops same as above. Cost includes travel, per diem and honorarium.

Pre-service and In-service Teaching Materials: Materials of Interrelated Explorations in Science program cost $30.00 per grade level.

PROJECT EVALUATED:

Yes X No ____ Internal ____ External Agency ____

Pertinent Research Studies: Monograph on Interrelated Explorations in Science, published by P. K. Yonge Laboratory School.

In-House or Unpublished Research:

Interrelated Explorations in Science (IES), a three year Unified Science program for grades 6, 7 and 8 has been developed at the P. K. Yonge Laboratory School and tested throughout the state of Florida.

Testing included a pre-achievement and pre-attitude test given at the beginning of the school year and a post-achievement and post-attitude test given at the end of the year to students using the IES program and to equal numbers of students not involved with the IES program.

Data analysis of test results showed no significant achievement difference between the two groups. However, a significant difference was found in attitude between students in the IES program compared with students not in the program.

PROJECT PUBLICITY:

Griffin, Nancy C. Brochure Interrelated Explorations in Science P.K. Yonge College of Education, University of Florida, 1973.

Griffin, Nancy C. "Beginnings to Relating Sciences" Audio-Visual tape Prepared upon request for Unified Science Center, Columbus, Ohio, 1973.

Griffin, Nancy C. "Interrelated Explorations in Science - An Overview" Alberta Science Education Vol. XIII, No. 2, September, 1974. Edmonton, Canada.

Griffin, Nancy C. "Interrelation Science Through Body Involvement" Activities Researches Pedagogiques, Vol. 3 #13, January, 1974. Paris, France.

Griffin, Nancy C. "Ecological Studies in the Middle School", Science and Children, October, 1975. Washington, D. C.

Griffin, Nancy C. Interrelated Explorations in Science (A Unified Science Program for Middle School) Research Monograph. P.K. Yonge Laboratory School, 1975.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Research, data analysis compiled, research monograph completed, activity materials revisions completed.

PLANS FOR THE FUTURE:

Not defined at this time.

ISSUE ORIENTED MODULES

American Association of Physics Teachers (AAPT)
Graduate Physics Building
SUNY, Stony Brook
Stony Brook, New York 11794
U.S.A.

Telephone: (516) 246-6840

Director: Melba Phillips

Project Duration: 1975-

Age: 18 +
Ability: all
Subject: physics
Language: English
Translations: none
Testing of Students: not determined yet

Materials Developed by Project:

Print	Non-Print
Modules	none

Types of Learning Experiences:
- Lecture
- Discussion
- Independent Study
- Lab Activities

PRINCIPAL PROFESSIONAL STAFF:

Dean Zollman, Coordinator for the project.

PROJECT HISTORY:

Principal Initiator(s): AAPT Committee on Physics in two-year colleges and A.A. Strassenburg

Reason(s) for Project Initiation: To develop modules on physics of contemporary issues.

Evolution and Development of the Project:
1. Project began the summer of 1975.
2. In the fall of 1975 the project invited physics teachers and others to submit completed modules by March 1, 1976.
3. These modules are now being evaluated.

PROJECT OBJECTIVES:

Overall Project Purpose: To provide modules for introductory physics classes on the physics related to contemporary social issues.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Introductory College Physics Students.

Ways in which it differs from similar or previous programs: The modules are being produced in two ways: 1) By commissioned authors; and 2) by individuals who are entering a contest. The entries will be judged and the best ones selected for inclusion. Prizes are to be awarded to the winners.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

None are available at present.

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: Modules

TEACHER PREPARATION: None

PROJECT EVALUATED:

Yes ____ No X Internal ____ External Agency ____

In-House or Unpublished Research: A survey of all colleges (two and four-year) was completed. This survey determined the types of physics course taught at the introductory level by colleges.

Issue Oriented Modules (2)

PROJECT PUBLICITY: AAPT Announcer October, 1975 and December, 1975.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not Applicable

PLANS FOR THE FUTURE:

Evaluation of modules will be completed, and final versions will be made available.

THE MADISON PROJECT

1210 West Springfield Avenue
Urbana, Illinois 61801
U.S.A.

Telephone: (217) 333-0150

Director: Robert B. Davis

Project Duration: 1957-

Additional information, see also Clearinghouse Reports: 9,8,7,6,5 4,3,2,1

Age: 7-15, adult
Ability: all, present work for gifted students
Subject: math, computer science, ed tech
Language: English
Translations: Japanese
Testing of Students: written achievement and oral tests, teacher judgments, filmed and videotaped behavior

Materials Developed by Project:

Print	Non-Print
Textbooks	Computer-Assisted Instruction Units
Supplementary Books	
Tchr. Manuals	
Overview	
Newsletters	

Types of Learning Experiences:

For Gifted Students:
- Lecture
- Seminar
- Discussion

For All Ability Levels:
- Computer Assisted Instruction

PRINCIPAL PROFESSIONAL STAFF:

Robert B. Davis, Director
Katie Hannibal, Teacher
Curtis McKinght, Teacher
Lesson Designers: Donald Cohen, Gerald Glynn, Charles Weaver, Bonnie Anderson Seiler, Sharon Dugdale, David Kibbey.

PROJECT HISTORY:

Principal Initiator(s): Robert B. Davis, Donald Kibbey, and Jacqueline Grennan Wexler.

Reason(s) for Project Initiation: To improve school mathematics

Evolution and Development of the Project:

1. Math for 7th grade low achievers;
2. Math for gifted children in grades 2 through 9;
3. Math and teacher training for all students, especially in big cities (e.g., New York City);
4. Math for gifted students in grades 7 through 10; and
5. Computer Assisted Instruction (CAI) for all students.

PROJECT OBJECTIVES:

Overall Project Purpose: To improve school mathematics

Specific Objectives: 1) Cognitive improvement of content (improve definitions, notations, sequencing and selection of topics); 2) Create special curricula for different student groups; 3) Create better teacher-education programs; 4) Create useful Computer Assisted Instruction (CAI) units; and 5) In-depth studies of student understanding and student motivation.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students in grades 2 through 10. Different components of the program have different target groups.

Ways in which it differs from similar or previous programs:

1. The basic activity in designing lessons is, first of all, exploration with students of what they already know, and what they are prepared to learn.
2. There is a greater-than-usual distinction between programs for different student populations. In particular, the program for gifted students gets to calculus by grade 9.

UNIQUE CHARACTERISTICS OF THE PROJECT: (continued)

Ways in which it differs from similar or previous programs: (continued)

3. There is greater concern for class size, frequency of meetings, and similar parameters, and some novel solutions.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Davis, Robert B. Discovery in Mathematics: Student Discussion Guide.	Not Given	Addison-Wesley
Davis, Robert B. Discovery in Mathematics: A Text for Teachers.	Not Given	Addison-Wesley
Davis, Robert B. Explorations in Mathematics: Student Discussion Guide.	Not Given	Addison-Wesley
Davis, Robert B. Explorations in Mathematics: A Text for Teachers.	Not Given	Addison-Wesley
Cohen, Donald. Inquiry in Mathematics via the Geoboard.	Not Given	Walker Publishing
The Journal of Children's Mathematical Behavior. From: The Study Group for Mathematical Behavior. 1210 W. Springfield, Urbana, Illinois 61801	$3.75/issue $15.00/volume	Project Director
Computer Assisted Instruction (CAI) Mathematics Lessons.	Not Given	Control Data
Madison Project Films - showing typical actual lessons. Curriculum Laboratory, University of Illinois, Urbana, Illinois 61801.	Not Given	Project Director
Davis, Robert B. Teacher's Commentary - A Concrete Approach to Introductory Ideas in Mathematics.	Not Given	Houghton-Mifflin

PRESENT COMMERCIAL AFFILIATIONS:

1. Addison-Wesley
   Reading, Massachusetts 01867

2. Walker Publishing Company
   720 5th Avenue
   New York, New York

3. Control Data Corporation
   Corporate Headquarters
   Minneapolis, Minnesota 55440

4. Houghton-Mifflin Company
   One Beacon Street
   Boston, Massachusetts 02107

MATERIALS AVAILABLE FREE:

Some issues of The Journal of Children's Mathematical Behavior and use of some films listed in Materials Already Produced above.

ADDITIONAL MATERIALS BEING DEVELOPED:

Program for gifted students in grades 7 through 10.

TEACHER PREPARATION:

Consultant Services: Experts available in most sections of the United States. Names on request.

Pre-service and In-service Training: For current information, write to the project director.

Pre-service and In-service Teaching Materials: For current information, write to the project director.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency X

Name of Outside Evaluators: Educational Testing Service & R.P. Dilworth, Cal. Tech.

Pertinent Research Studies:

1. Dilworth, R.P. "The Changing Face of Mathematics Education," Final Report of Specialized Teacher Project, California State Department of Education, Sacramento, California, 1973.
2. Davis, Robert B. A Modern Mathematics Program as it Pertains to the Interrelationship of Mathematical Content, Teaching Methods and Classroom Atmosphere, The Madison Project, report submitted to the Commissioner of Education, U.S. Department of Health, Education & Welfare, 1965.
3. Davis, Robert B. A Modern Mathematics Program as it Pertains to the Interrelationship of Mathematical Content, Teaching Methods and Classroom Atmosphere, The Madison Project, 2 Vols. report submitted to the Commissioner of Education, U.S. Department of Health, Education & Welfare, 1967.
4. Davis, Robert B. "Children's Learning of Mathematics," to appear in L'Insegnamento Integrato Della Scienze Nella Scuola Primaria, Rome: Accademia Nazionale Dei Lincei (in press).
5. Davis, Robert B. "Observing Children's Mathematical Behavior as a Foundation for Curriculum Planning," The Journal of Children's Mathematical Behavior, Vol. I, No. 1 (Winter, 1971-72).
6. Davis, Robert B. "Cognitive Processes Involved in Solving Simple Algebraic Equations," The Journal of Children's Mathematical Behavior, Vol. I, No. 3 (Summer, 1975).

Availability of Evaluative Data: Please write to Project Director.

PROJECT PUBLICITY:

Davis, Robert B. "Observing Children's Mathematical Behavior as a Foundation for Curriculum Planning," The Journal of Children's Mathematical Behavior, Vol. I, No. 1 (Winter, 1971-72).

PROJECT ACTIVITIES SINCE 1974 REPORT:

1. Developing math curriculum for gifted 7th graders through 10th graders;
2. Developing CAI lessons for all ability levels.

PLANS FOR THE FUTURE:

1. Continue development of program for gifted students;
2. Continue development of CAI lessons; and
3. Develop improved procedures for studying student understanding and motivation.

MARINE ENVIRONMENTAL STUDIES

Toll Gate High School
575 Centerville Road
Warwick, Rhode Island 02886
U.S.A.

Telephone: (401) 738-9200 ext. 20

Director: David Whitaker

Project Duration: 1973 -

Age: 17-18
Ability: average, above average
Subject: marine science
Language: English
Translations: none
Testing of Students:
- written achievement tests
- lab performance tests
- teacher judgments
- student attitude q're

Materials Developed by Project:

Print	Non-Print
Lab Books	Slide Tape
Field Guides	
Eval. Materials	
Overview	

Types of Learning Experiences:
- Lecture
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Richard Bellavance, Teacher

PROJECT HISTORY:

Principal Initiator(s): Julius Breit, Maurice Blais, Ernest Slocum

Reason(s) for Project Initiation: To capitalize on Rhode Island's greatest natural resource - Narragansett Bay and to provide hands-on instruction in science.

PROJECT OBJECTIVES:

Overall Project Purpose: To teach marine environmental studies on the high school level.

Specific Objectives:

1. To learn marine science by actual involvement.
2. To revitalize and stimulate interest in science education.
3. To develop a marine science curriculum.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: High school juniors and seniors. Passing grade in Biology I is the only pre-requisite.

Ways in which it differs from similar or previous programs: There are other programs dealing with oceanography, but all are one-shot, one-day per year, reaching many students. This program services fewer students, but in much greater depth. The course is year long and students meet for 3 hours per week.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Brochure	Free	Project Director
150 page Lab-Field Manual	Free	Project Director
Videotape, ½" (send blank tape for duplication)	not given	Project Director

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: Brochure and Lab-Field Manual.

ADDITIONAL MATERIALS BEING DEVELOPED: Not Answered.

TEACHER PREPARATION:

Consultant Services: Postal correspondence with project coordinator.

Pre-service and In-service Training: Three-hour field-based workshops are offered each June. There is no cost; teachers provide their own transportation to Rhode Island.

PROJECT EVALUATED:

Yes X No ____ Internal ____ External Agency ____

Name of Outside Evaluators: Curriculum Research Center
University of Rhode Island
Kingston, Rhode Island

In-House or Unpublished Research: Various evaluations guided the evolution of the program during the first two years.

PROJECT PUBLICITY:

American Biology Teacher, Vol. 37, No. 4, April 1975, "Marine Field Study on the High School Level"

PROJECT ACTIVITY SINCE 1974 REPORT: Not applicable.

PLANS FOR THE FUTURE:

Project will be incorporated into the school department curriculum, in form identical to the one used during 3-year Title III ESEA pilot.

METRE AND LITRE ARE NEATER

Mathematics Unit
California State Department
of Education
721 Capitol Mall
Sacramento, California 95814
U.S.A.

Telephone: (916) 322-3284

Director: Robert F. Tardif

Project Duration: 1975

Age: Teacher Education
Ability: all
Subject: math, measurement
Language: English
Translations: None
Testing of Students: written achievement tests

Materials Developed by Project:

Print	Non-Print
Lab Books	Films
Charts	Models
	Lab Equipment

Types of Learning Experiences:

- Discussion
- Independent Study
- Lab Activities
- Demonstrations
- Audio/Visual
- Reading

PRINCIPAL PROFESSIONAL STAFF:

Joseph R. Hoffmann, Consultant, Trainer
Janine S. Martin, Consultant, Trainer

PROJECT HISTORY:

Principal Initiator(s): Interstate Consortium on Metric Education

Reason(s) for Project Initiation: To facilitate the conduct of metric workshops for teachers.

Evolution and Development of the Project: SRS Productions built the materials package using a training model developed by the California State Department of Education and published under the title Inservice Guide to Teaching Measurement (K-8): An Introduction to the SI Metric System.

PROJECT OBJECTIVES:

Overall Project Purpose: To provide a technically accurate training procedure for presenting measurement and metrics to K-8 teachers which also suggests how to teach these materials to children.

Specific Objectives: To expedite the training of 300,000 teachers in California schools.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All K-8 teachers.

Ways in which it differs from similar or previous programs: The project integrates a film presentation and a workshop activities booklet so that each workshop has commonality with other workshops using this model. Trainees emerge with an understanding of the metric system, how to measure, how children learn to measure, and how they might teach children and others to measure. The workshop is activity oriented.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Metre and Litre are Neater Film, 47 min., 16 mm, color	$495.00	SRS
Metre and Litre are Neater Participant Booklet/ Reference Manual	$2.85	SRS
Metre and Litre are Neater Leader's Guide	$.85	SRS

METRE AND LITRE ARE NEATER (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material	Cost	Source
Think Metric: Metre and Litre are Neater Wall Chart of Learning Model	$.50	SRS
Metric Survival Kit	$6.85	SRS and Enrich Inc.

PRESENT COMMERCIAL AFFILIATIONS:

SRS Productions
4224 Ellenita Avenue
Tarzana, California 91356

Enrich, Inc.
760 Kifer Road
Sunnyvale, California 94086

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: Not Answered

TEACHER PREPARATION:

Consultant Services: Contact Robert F. Tardif, Project Director

Pre-service and In-service Training: This is a teacher education project.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency X

Name of Outside Evaluator: Several County Offices

PROJECT PUBLICITY: None

PROJECT ACTIVITIES SINCE 1974 REPORT:

More than 100 workshops for trainers have been conducted in California by Department of Education staff.

PLANS FOR THE FUTURE:

Developing an omnibus metric model for high school and community college teachers.

MOUNTAIN VIEW CENTER FOR ENVIRONMENTAL EDUCATION

University of Colorado
1511 University Avenue
Boulder, Colorado 80302
U.S.A.

Telephone: (303) 492-8421

Director: David Hawkins

Project Duration: 1970-

Age: 3-12, adult
Ability: all
Subject: integrated science and math
Language: English
Translations: none
Testing of Students: not answered

Materials Developed by Project:

Print	Non-Print
Magazine	Science Equipment
Pamphlets	

Types of Learning Experiences: Not answered

PRINCIPAL PROFESSIONAL STAFF: Not answered

PROJECT HISTORY:

Principal Initiator(s): David Hawkins

Reason(s) for Project Initiation: To improve education in the schools.

Evolution and Development of the Project: The Mountain View Center for Environmental Education was established in 1970 under a grant from the Ford Foundation; its local beginnings, on a smaller scale, date from 1964. It is now a nationally respected teachers' center with a strong local orientation. While it is looked to for intellectual leadership by teachers' centers around the country, its main day-to-day focus is on work in the Boulder-Denver area. It serves preschool and elementary school teachers, teachers in day care centers, and future teachers from the University of Colorado and from other institutions in the state.

PROJECT OBJECTIVES:

Overall Project Purpose: The general goals of the Center are suggested by the second part of its name, "for Environmental Education." This means not just education for concerns about the natural environment but education through fuller use of all the environments in which children live--physical, social, natural, and the environments of books, ideas, and history. Environmental education should seek to provide fresh subject matter to extend the range of children's perception and understanding and their powers of analysis and expression. It puts a high value on skills and knowledge essential for further learning.

Specific Objectives:

1. To provide a place where teachers and others can see and freely use equipment and learning apparatus (much of it homemade and home-makeable), use our reference library, and talk with staff members about subject matter, specific teaching problems, and educational theory.
2. To provide workshop courses throughout the school year and in the summer, covering areas such as mathematics, science, language arts, environmental studies, social studies, art and craft, and music. (During the past five years some six hundred teachers have enrolled in workshop courses at the Center.)
3. To provide staff members who are available for follow-up work in individual teachers' classrooms.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Ways in which it differs from similar or previous programs: As local work permits, staff members become involved in projects outside the Boulder-Denver area. For two years the Center had a continuing commitment to help Sioux Indians obtain teaching qualifications. It has consulted on bilingual education programs in

MOUNTAIN VIEW CENTER FOR ENVIRONMENTAL EDUCATION (2)

UNIQUE CHARACTERISTICS OF THE PROJECT: (Continued)

Ways in which it differs from similar or previous programs: (continued)

western Colorado, and has served as consultant for innovative educational programs in San Francisco, New York, Boston, Washington, D.C., and elsewhere. Such activities help to maintain essential first-hand contact with a wide range of educational concerns and with the people who are involved with them.

The Center has, from time to time, provided an informal "home base" for persons whose work is not only intrinsically worth supporting but also adds a lively ingredient to the atmosphere of the Center. One of these is a gifted young Sioux sculptor and another a specialist in recreating traditional Southwestern Indian pottery.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
The Logic of Action: From a Teacher's Notebook by Frances P. Hawkins.	$3.00	Project Director
Yesterday I Found ... (A description of work in an English "Open" Classroom) by Dorothy and John Paull.	3.00	Project Director
Science Equipment in the Elementary School.	3.00	Project Director
OUTLOOK Magazine. (Three issues per year)		Project Director
Individual Subscription	$6.00/yr.	
Institutional Subscription	9.00/yr.	
Northumberland Children. A silent film, 45 minutes, of an excellent day care facility in northern England. Made by David and Frances Hawkins.	Not Given	Project Director

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION:

Pre-service and In-service Training: 1) In-service evening workshops; 2) Summer two-week workshops; and 3) In classrooms as teachers request help, there are no limits set in advance on the extent of these commitments.

Pre-service and In-service Teaching Materials: Reprints of articles on various aspects of science teaching and education more generally are available. They include: Ojo de Dios, Is It a Conglomerate?, One Blue Jay, Piaget Re-discovered, Away from Stages, Drops and Streams, Report of Three Days Spent in Washington, D.C., Photographs of Deaf Children in Nursery School, Thermodynamics of Purpose, On Understanding the Understanding of Children, Square Two--Square Three, Education and the Spirit of Science, Mind and Mechanism in Education, Messing About in Science, The Bird in the Window, Statement of Environmental Education, I-Thou-It, The Nature of Purpose, On Living in Trees, and Pendulums. (Single copies can be obtained without charge by interested individuals who write to the Mountain View Center.)

PROJECT EVALUATED:

Yes ____ No _X_ Internal ____ External Agency ____

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

MULTIMEDIA APPROACH TO SCIENCE STUDIES: STUDENT DEVELOPED RESOURCE CENTERS (MASS)

Byesville Elementary
212 Main Avenue
Byesville, Ohio 43723
U.S.A.

Telephone: (614) 685-3113

Director: Ginger S. Rutter

Project Duration: 1975 -

Age: 9-13
Ability: average
Subject: biol, chem, phys
Language: English
Translations: None
Testing of Students:
  written achievement tests
  teacher judgments
  student attitude q're
  checklists

Materials Developed by Project:

Print	Non-Print
Eval. Materials	Slides
Behavioral Objectives	Filmstrips
	Films
	Overhead Trans.
	Videotape
	Slide Tape
	Games

Types of Learning Experiences:
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Demonstrations
- Televised Lessons
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

Elaine Thorla, Janet Kline, Winnie Mae Sharpe, Judy Lahrmer, Sandy Davis - Project Teachers.

PROJECT HISTORY:

Principal Initiator(s): Project Director and Project Teachers.

Reason(s) for Project Initiation: Belief that this approach will increase science knowledge and improve student attitudes.

Evolution and Development of the Project: Teachers at Byesville Elementary planned for about two years for this project. Teachers decided how to approach the problem of a need for an improved science program. This approach was selected as a result of the success of a Martha Holden Jennings Foundation project, which was done at the school using videotape recordings for career education. Teachers felt that since this approach worked in the mini project, it could be expanded to be a good method for improving science learning.

PROJECT OBJECTIVES:

Overall Project Purpose: To provide elementary students with an opportunity to increase their knowledge in science while developing a student-made resource center. Students are developing multimedia science materials for students and teachers.

Specific Objectives:

1. To develop resource materials for resource center.
2. To develop nine broad units (three for each level).
3. To recruit volunteers.
4. To provide Pre-service training for teachers to learn equipment use.
5. To increase student knowledge in basic science concepts.
6. To teach students equipment use and help them develop resource materials.
7. To demonstrate a change in student attitudes towards school and community.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Elementary school students from a low and lower middle class rural setting, deprived of cultural and intellectual backgrounds.

Ways in which it differs from similar or previous programs: There are no other projects believed to be using a similar approach to try to solve the problem of low achievement in science.

MASS (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material

All materials listed are available from MASS for reproduction and postage costs.

- Concentration - Match Animals
- Concentration Game - Animals
- Old Factory Card Game
- Pollution Game
- Pollution Monopoly
- Photography Poster
- Race Game - Animals
- The Science Game
- The Science Road of Light Game
- "Turn-Over" - Animal Game
- Wheel of Fortune - Science
- "Whiz Spin" - Vocabulary Animals
- Electronic Question Boards:
  - Misc.
  - Sound
  - Water
- Transparencies:
  - Flower Parts
  - Fish
  - Birds
  - Mollusks
  - Hydra
  - Metamorphosis
  - Photogram Instructions
  - Developing Film
  - Camera Parts
  - Volcanoes
  - Trees
  - Australian Animals
  - Bones
- Ecosystems:
  - Pond Life
  - Desert Life
  - Forest
  - Seashore
  - Dinosaurs
- Slide/Tape - Guernsey Hospital
- Slide/Tape - Muskingum College Science Bldg.
- Video Tape Recordings:
  - Science Experiments
  - Social Studies Concept Plays
  - Triumph of Man
  - Frontier Medicine
  - Weather
- Filmstrips:
  - Weather Symbols
  - First Man
  - Photography
  - Television
  - Radio and TV
  - Chemistry (2)
  - Cats
  - Flowers
  - Storms
  - Dinosaurs
  - Magnets and Magnetism
  - Radio
  - Weather Instruments
  - Digestive System
  - Airplanes - Aerodynamics
  - Fossils
  - Clouds
  - Twin Lens Reflex Camera
  - Single Lens Reflex 35mm Camera
  - Communications
  - Pollution
  - Snakes
  - Darkroom
  - Developing
  - Mammals
  - Marine Life
  - Our Five Senses
  - Weather

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

- 8mm Movies
- Filmstrips
- Slide/Tape Presentations
- Video Tapes
- Transparencies
- Scrapbook Collections
- Study Prints

TEACHER PREPARATION:

Consultant Services: Summer in-service training is available from the project director at per-diem/conference fee rate.

Pre-service and In-service Training: Elementary usage and production of video tape recordings as well as camera and darkroom techniques.

Pre-service and In-service Teaching Materials: None at present.

PROJECT EVALUATED:

Yes _____ No _X_ Internal _____ External Agency _____

PROJECT PUBLICITY: None at Present

BRIEF SUMMARY OF PROJECT ACTIVITIES SINCE 1974 REPORT: None

PLANS FOR THE FUTURE: Not Answered

NATURE OF EVIDENCE (MIDNEV)

Philosophy Department
West Virginia University
Morgantown, West Virginia 26505
U.S.A.

Telephone: (304) 293-3641

Directors: Gene D'Amour and
Charles Wales

Project Duration: 1971-

Additional information, see also
Clearinghouse Reports: 9

Age: 17+
Ability: average
Subject: biol, chem, phys, soc. sci, ed tech, philosophy of science
Language: English
Translations: none
Testing of Students: written achievement, lab performance and oral tests

Materials Developed by Project:

Print
- Textbooks
- Lab Books
- Supplementary Books
- Programmed Units
- Activity Sheets
- Tchr. Manuals
- Eval. Materials
- Behavioral Objectives
- Overview

Non-Print
- Slides
- Films
- Slide Tape
- Games
- Lab Equipment

Types of Learning Experiences:
- Discussion
- Lab Activities
- Independent Study
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

Charles Wales, Educational Engineering
Gene D'Amour, Philosophy of Science
Twelve faculty members from Natural and Social Science and Humanities

PROJECT HISTORY:

Principal Initiator(s): Gene D'Amour

Reason(s) for Project Initiation: University's commitment to multidisciplinary instruction for freshman level students.

Evolution and Development of the Project: Under the direction of Gene D'Amour, twelve faculty members from twelve different fields developed a common theme for this multidisciplinary course, common objectives and chose a teaching methodology. Thereafter, Dr. Wales joined Dr. D'Amour in directing the development of Guided Design materials, study guides, programmed materials, and audio visual materials. Material was tested in a number of classes over a period of three years involving extensive revision. Approximately 80% of prepared materials are in final revision stages as of Summer 1976.

PROJECT OBJECTIVES:

Overall Project Purpose: The purpose of the course is: (1) to introduce students to the similarities and differences between the ways in which professionals in the natural sciences, social sciences and humanities gather evidence; (2) to develop specific decision-making abilities in the students and (3) to introduce the students to subject matter in the natural sciences, social sciences and humanities.

Specific Objectives: Subject matter objectives, decision-making objectives, and evidential method objectives are given in behavioral form preceding each project. When students complete the course they are able to use technical language in the philosophy of science, such as the concepts of "law," "hypothesis," "theory," "model," "prediction," "deductively valid argument," "lawful deduction explanation," "purposeful explanation," "control group," "theoretical term," "initial condition," to state the rationale for different patterns used in the gathering of evidence. They are also able to state the similarities and differences between the goals, evidential methods, achievements, and attitudes of the natural sciences, social sciences and humanities.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: The primary intended audience is that of the average freshman college student.

Ways in which it differs from similar or previous programs: There are two characteristics of this program which are not possessed by other "mode of inquiry" type courses. First, it uses the guided design method of instruction which involves students working in small discussion groups, as they, in a step-by-step fashion, work through a problem in a given discipline. Their progress is guided by written instructions which are followed by written feedback which presents an example of a response to the instruction by a professional in the field. The students are then able to compare their decisions with those of a professional. All science subject matter is taught in the context of making decisions about realistic problems.

The evidential aspect of the course was prepared by each professional in conjunction with a philosopher of science whose specialty is logic and the methodology of the sciences.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Materials listed below are available at a cost of approximately $2.50 per project:

Materials available from West Virginia University Foundation:
Education for Decision-making by Charles Wales (Educational Engineering).
Consultants for Rwamkoma: Scientists or Witches by Gene D'Amour (Philosophy)
Discovering How Eye Glasses Work by Fred Goldberg (Physics)
How to Take a Sarumi to Lunch by Patricia Rice (Anthropology)
Water for Rwamkoma by Robert Behling (Geology)
The Allocation of Resources in Rwamkoma by Rodger Yeager (Political Science)
The Priapus -- E. Z. Leigh Escapade by John Stasny (English)
Reading, Writing and Reinforcement in Rwamkoma by Kennon A. Lattal (Psychology)
The Case of the Mysterious Drink-Happy Bird by C. Gordon McCarty (Chemistry)
Rwamkoman Theatre Project by Patrick Murphy (Drama)
A History for Rwamkoma by Charles Connell (History)

PRESENT COMMERCIAL AFFILIATIONS:

West Virginia University Foundation is presently publishing project materials on a temporary basis. They may be ordered from the West Virginia University Bookstore by sending check, money order and/or invoice to Dr. D'Amour.

MATERIALS AVAILABLE FREE:

Film of course which describes the Guided Design Method, available from Exxon Education Foundation, Impact Program.
Booklet describing the Guided Design Method with samples from Nature of Evidence course from Dr. Charles Wales, Freshman Engineering, West Virginia University Morgantown, West Virginia.
Articles describing course published in numerous journals from Dr. Gene D'Amour, West Virginia University, Morgantown, West Virginia.

ADDITIONAL MATERIALS BEING DEVELOPED:

Slide tape and other audio-visual materials for individual projects, also materials involving exercises in small group communications.

TEACHER PREPARATION:

Consultant Services: Dr. D'Amour and Dr. Wales are available for consulting.

Pre-service and In-service Training: Dr. D'Amour and Dr. Wales, individually or together, conduct two-day workshops which teach the use and preparation of Guided Design materials as well as the development of Nature of Evidence programs. Approximately $150.00 per day for Dr. D'Amour and $250.00 per day for Dr. Wales, plus travel and lodging expenses. Consulting services are available at West Virginia University, including workshops for groups of seven or larger.

TEACHER PREPARATION: (Continued)

Pre-service and In-service Teaching Materials:
Wales, Charles, and Staegers, Robert, Guided Deisgn, available from Dr. Wales, Freshman Engineering, West Virginia University, Morgantown, West Virginia. Cost: $7.00.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency X

Name of Outside Evaluators: Exxon Education Foundation, Lily Foundation and a number of other universities.

Pertinent Research Studies: None

In-House or Unpublished Research: 16 pf and Watson Glasser Test of Critical Thinking have been utilized as well as P.O.I. Research on small group interaction, change in student performance vis à vis course objectives, student attitudinal evaluations, and cost effectiveness are presently being researched.

Availability of Evaluative Data: None as yet

PROJECT PUBLICITY:

Bynum, Terrell, Editor, Teaching Philosophy, Center for Philosophic Exchange.
D'Amour, Gene and Goldberg, Fred, Integrating Philosophy of Science and Physics through the Guided Design Method, American Journal of Physics.
D'Amour, Gene and Wales, Charles, A New Approach to Multidisciplinary Instruction, forthcoming.
D'Amour and Wales, Guided Design, Chapter 7.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE:

A number of articles presently being written for publication 1977-78, as well as an instructor's manual.

OUTDOOR BIOLOGY INSTRUCTIONAL STRATEGIES (OBIS)

Lawrence Hall of Science
University of California
Berkeley, California 94720

Telephone: (415) 642-3679

Director: Watson M. Laetsch

Project Duration: 1972-

Additional Information: See Also Clearinghouse Report 9

Age: 10-15
Ability: all
Subject: biology, envir. ed
Language: English
Translations: none
Testing of Students:
- teacher judgments
- interest inventories
- observational measures

Materials Developed by Project:

Print	Non-Print
OBIS Trial Edition (sets 1&2) Trial Module Activity Feedback cards OBIS Newsletter OBIS Workshop Primer Approaches to OBIS (Trial Edition)	ACA/OBIS Camp Kit Field Equip.

Types of Learning Experiences:
- Discussion
- Field Experiences
- Simulations
- Games
- Crafts

PRINCIPAL PROFESSIONAL STAFF:

Dr. Watson M. Laetsch, Director
Dr. Herbert D. Thier, Co-Director
Dr. Robert C. Knott, Assistant Director
Author/Developers: Dave Buller, Linda DeLucchi, Larry Malone, Gary Heath, Jennifer White

PROJECT HISTORY:

Principal Initiator(s): Dr. Watson M. Laetsch, Dr. Herbert Thier, Dr. Chester Lawson

Reason(s) for Project Initiation: A basic understanding of biological relationships is essential if we are to manage our ecosystem sensibly. The OBIS project was initiated to give youngsters firsthand experiences in man-managed outdoor environments in order to provide a base that youngsters could use in the future to consider environmental decisions more intelligently.

Evolution and Development of the Project: The project started by identifying the needs of the various community youth groups. Trial groups of youngsters were used to test and modify activity ideas. Two activity manuals (the Pond Unit and Lawn Unit) evolved, but these manuals did not seem to meet the needs of the community groups.

In early 1974, a new format was developed, the folio format in which each activity was independent in itself. Each folio written for the leader included background material on the biological concept of the activity, the challenge of the activity for the youngsters, the materials needed, the preparation required, a step-by-step outline of the action, suggested open-ended discussion question, follow through activities, plus a series of other OBIS activities related to the particular activity. Twenty-four activities, some dealing with common terrestrial environments, others with aquatic environments formed Trial Edition I. This proved to be a very flexible and effective format for our target group.

We continue to use community groups to develop our ideas into activities. A few selected Trial Centers assist the development process by testing activities in different environments around the country. Volunteer Resource Centers around the United States help to pass the OBIS word to other community groups.

OBIS (2)

PROJECT OBJECTIVES:

Overall Project Purpose: If we are to make intelligent decisions regarding the future of our ecosystem, we must have a thorough understanding of basic biological relationships. The ecological understanding that grows with each OBIS experience will provide a base that youngsters can use in the future to consider environmental and ecological decisions more intelligently.

Specific Objectives:

- To stimulate curiosity in the youngster about familiar outdoor environments.
- To develop investigative and observational skills.
- To teach basic concepts of ecology by investigating the interrelations and interactions of plants, animals, and the physical environment, including the role man plays in the different ecosystems.
- To provide exciting and educational outdoor experiences for both leaders and youngsters.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: OBIS activities are designed primarily for 10-15 year old youngsters in community groups such as Scouts, recreation centers, church groups, 4-H, after school clubs and camps. Because of activity flexibility, OBIS can be adapted for both older and younger groups.

Ways in which it differs from similar or previous programs:

a) Unlike other biology programs, OBIS is not designed as a school science curriculum, although many of the materials may be suited for use by school groups. OBIS activities are oriented toward community-sponsored organizations.

b) OBIS activities do not require a leader knowledgeable in biology or natural history. All the information necessary for the activity is contained in the folio.

c) Activity equipment tends to be simple, inexpensive, and homemade.

d) OBIS departs from the common curriculum-development procedure of determining a single sequence of learning activities leading to specific concepts. Instead, OBIS presents a variety of alternative strategies and techniques for environmental study. Games, simulations, art activities, direct investigations of organisms, and observations, are examples of various strategies used. Individual OBIS activities can be used to enrich an existing program or a new program can be created by sequencing several OBIS activities and forming a module. OBIS activities are open ended and flexible.

e) OBIS is based on a broader viewpoint of environmental education than many environmental groups which focus on specific instances of pollution control or recycling. Strategies useful for the study of ecosystems are believed universally applicable wherever there is life and are not limited to any specific environment.

f) The community group youngster plays a major role in developing OBIS activities. The published activities are a result of their input.

g) OBIS is fun and exciting for both leaders and youngsters.

h) OBIS uses the discovery approach to learning.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
OBIS Trial Edition Set I	\$8.50	OBIS[1]
OBIS Trial Edition Set II	9.50	OBIS
Trail Module - Series of four activities	2.00	OBIS
Lawn Guide	.60	OBIS
Pond Guide	.60	OBIS
OBIS Workshop Primer	Free	OBIS
OBIS Resource Center Directory	Free	OBIS
OBIS Newsletters	Free	OBIS

OBIS (3)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material	Cost	Source
Approaches to OBIS - contains an introduction to the program and materials	Free	OBIS
Activity Feedback Cards	Free	OBIS
ACA/OBIS Camp Kit - 24 OBIS folios from Sets I and II to meet the needs of camps and to reflect four major themes: Developing Environmental Awareness, Knowledge of Natural History, Understanding the Meaning of Ecology and Understanding Environmental Quality.	$11.95	ACA[2]

[1] OBIS
Lawrence Hall of Science
University of California
Berkeley, California 94720

[2] American Camping Association
Bradford Woods
Martinsville, Indiana 46151

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: See MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS

ADDITIONAL MATERIALS BEING DEVELOPED:

OBIS Trial Edition Set III
Family outdoor biology activities
Individualized activities

TEACHER PREPARATION:

Consultant Services: Resource Centers across the country provide information, advice, sample materials, and in some cases, materials for purchase and workshops. Since these centers are unfunded, the service provided will vary according to the time and funds available to the volunteer directors.

Pre-service and In-service Training: OBIS staff members and resource center directors will be presenting workshops at some national environmental education and science education conferences. The cost of in-service teacher training or workshops is determined by each Resource Center Director.

Pre-service and In-service Teaching Materials: Primer for Conducting an OBIS Workshop (Free)

PROJECT EVALUATED:

Yes X No _____ Internal _____ External Agency _____

Name of Outside Evaluators: By user groups who decide to adopt OBIS for their programs.

Pertinent Research Studies: Falk, J; Malone, L; Linn, M; March 1975 Outdoor Biology Instructional Strategies: Development and Evaluation. American Biology Teacher 37 (3)

PROJECT PUBLICITY:

McCormack, A.J. Oct. 1974, Outdoor Biology Instructional Strategies. Science and Children 12 (2).
McCormack, A.J. Oct. 1974, OBIS--The Uncurriculum, Learning 3 (2)
Oct. 1974, OBIS: Biology Outdoors and Out of School. E.E. Report [illegible] (10)
Dec/Jan, 1976 OBIS, E.E. Report, 4(1)
in press, Buller, D, 1976, ACA/OBIS Camp Kit, Camping Magazine.

OBIS (4)

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Developing OBIS Trial Edition Set III.

P. K. YONGE LABORATORY SCHOOL CORRELATED SCIENCE PROGRAM (CSP)

P. K. Yonge Laboratory School
University of Florida
Gainesville, Florida 32611
U.S.A.

Telephone: (904) 392-1526

Director: Thomas Gadsden, Jr.

Project Duration: 1968-

Additional information, see also Clearinghouse Reports: 9

Age: 15-17
Ability: all
Subject; biol, chem, phys, earth-space, soc. sci.
Language: English
Translations:
Testing of Students: written achievement tests, laboratory performance tests, teacher judgments

Materials Developed by Project:

Print
- Lab Books
- Activity Sheets
- Tchr. Manuals
- Field Guides
- Eval. Materials
- Behavioral Objectives
- Overview
- Supplementary Readings
- Programmed Materials

Non-Print
- Overhead Trans.

Types of Learning Experiences:
- Lecture
- Seminar
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Demonstrations
- Simulations

PRINCIPAL PROFESSIONAL STAFF: Co-developers:

Mrs. Virginia F. Allen
Dr. Donald P. Altieri
Dr. Paul A. Becht
Dr. Thomas Gadsden, Jr.

PROJECT HISTORY:

Principal Initiator(s):
Dr. D. P. Altieri, Mrs. Virginia F. Allen, Dr. Thomas Gadsden, Jr.

Reason(s) for Project Initiation: Change in philosophy, Development of a new course.

Evolution and Development of the Project:

1968-1971	Initial Development and pilot test with single class of 20 students (This is a three-year sequence)
1971-1974	Full Development and Implementation at P. K. Yonge
1974-1976	Field Testing and Revision

PROJECT OBJECTIVES:

Overall Project Purpose: Development of a three-year unified science program, field-testing and implementation in Florida schools.

Specific Objectives: To design a three-year unified sequence which:

1. Centers upon major interdisciplinary concepts having lasting value and meaning for students.
2. Utilizes experiences to help students develop the attitudes and abilities needed to use scientific processes, individually and in groups, both in investigating scientific questions and examining questions of social concern.
3. Provides opportunities for students to delve into questions concerning the impact that science is having on their lives, values, and culture.

PROJECT OBJECTIVES: (continued)

Specific Objectives: (continued)

4. Incorporates teaching approaches and techniques designed so that all students will find some degree of success, thus helping them to perceive themselves capable of living successfully within a dynamic science and technology.
5. Includes learning materials structured so that students can become increasingly able to direct their own learning in terms of rate and mode and content of learning.
6. Offers flexibility in organization such that the curriculum can be readily varied from year to year, from school to school, from teacher to teacher, and even from student to student.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Aimed toward the general population in grades 10-12. May not be appropriate, however, for those of extremely limited background and ability.

Ways in which it differs from similar or previous programs: Unified approach, concept-centered three-year sequence designed to build learnings in a spiraling manner. The program attempts to fully involve students through activity and field experience and topics related to themselves. Interrelationships between science and society given special emphasis.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
1. Overview of the Correlated Science Program	Free	Project Director
2. Year I student and teacher materials Includes unit objectives, unit flow charts, student activities, teacher guide materials, student evaluation materials, unit evaluation materials.	Free Sample	Project Director
3. Year II student and teacher materials (Partially completed)	Free Sample	Project Director
4. Year III student and teacher materials (Partially completed)	Free Sample	Project Director

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: See: Materials Already Produced.

ADDITIONAL MATERIALS BEING DEVELOPED:

Monograph explaining the Correlated Science format and the process of developing curricular materials using that format.

TEACHER PREPARATION:

Consultant Services: In-service workshops, Summer workshops, and Individual consultation available.

Pre-service and In-service Training: In-service workshop presently being taught (1975-76 school year) in Florida. Three continuing Education Units given for participation at a total cost of $5. Participants provide own transportation and per diem.

TEACHER PREPARATION: (Continued)

Pre-service and In-service Training: In preparation.

PROJECT EVALUATED:

Yes X No. ____ Internal X External Agency ____

Pertinent Research Studies: In preparation.

In-House or Unpublished Research: Not available yet.

Availability of Evaluative Data: Not yet.

PROJECT PUBLICITY:

1. Altieri, D.P., Gadsden, T., Jr., and Allen, V. 1971 "An Operational Model for Individualizing Instruction" Science Education 55 (3): 269-273
2. Gadsden, T., Jr., Allen, V.F., and Dixon, W. L., Jan. 1975 "Cutting Boundaries with Correlated Science" School Science and Mathematics 75 (1): 80-86.
3. "Unified Science Education Programs and Materials" ERIC SMEAC Occasional Paper Series #10.
4. "Abstracts of Evaluative Studies Related to Unified Science Programs" Center for Unified Science Education, 1974.
5. "P.K. Yonge Correlated Science Program - A Theoretical Framework" P. K. Yonge Laboratory School, April, 1972.

PROJECT ACTIVITIES SINCE 1974 REPORT:

In-Service workshops (2)
Drive-in conferences (2)
Additional development of Years II and III, Completion of Year I
Monograph describing format and curricular development approach underway.

PLANS FOR THE FUTURE:

Completion of Years II and III during 1976
Publication 1977

PEST POPULATION ECOLOGY, AN INTER-UNIVERSITY TRAINING PROGRAM

Department of Entomological Sciences
Room 137 Giannini Hall
University of California
Berkeley, California 94720
U.S.A.

Telephone:

Director: P. S. Messenger

Project Duration: 1969-

Age: 18+
Ability: not answered
Subject: biology
Language: English
Translations: none
Testing of Students: not answered

Materials Developed by Project:

Print	Non-Print
none	none

Types of Learning Experiences:
Lecture
Seminars
Discussion
Independent Study

PRINCIPAL PROFESSIONAL STAFF:

P. S. Messenger, Project Director
D. Pimentel, Integrated Project Director (Cornell University)
C. B. Huffaker, Subproject Director (Univ. of California, Berkeley)
P. DeBach, Subproject Director (Univ. of California, Riverside)
D. E. David, Subproject Director (N. C. State University)
P. Oman, Subproject Director (Oregon State University)

PROJECT HISTORY: Not answered

PROJECT OBJECTIVES:

Overall Project Purpose: To bring together into one postgraduate educational experience elements of animal population theory and applied pest population control and management. To expose the graduate student to the latest experimental and theoretical developments in the natural control and regulation of numbers as a background and framework within which to explore, refine, and apply ecologically sound methods for the practical suppression of pests.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Graduate students in entomology, zoology, botany, or biology who wish to pursue a course of training and research in pest population ecology.

Ways in which it differs from similar or previous programs: This program provides an inter-regional, interdisciplinary experience for doctoral students in the field of ecology, with emphasis on pest population ecology. Students in the program, though based at the campus of choice, are transferred for short periods of time (up to a semester) to another campus in the program, depending upon the subject of their dissertations and varied expertise at the campuses. Participating faculty visit each campus to present lectures and seminars, hold conferences and participate in discussions with the students.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: Not applicable

PRESENT COMMERCIAL AFFILIATIONS: Not applicable

MATERIALS AVAILABLE FREE: Not applicable

ADDITIONAL MATERIALS BEING DEVELOPED: Not applicable

TEACHER PREPARATION: Not applicable

PROJECT EVALUATED:

Yes _____ No X Internal _____ External Agency _____

PROJECT PUBLICITY: Not answered

PEST POPULATION ECOLOGY, AN INTER-UNIVERSITY TRAINING PROGRAM (2)

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

PHYSICAL PROCESSES IN TERRESTRIAL AND AQUATIC ECOSYSTEMS

Center for Quantitative Science in
Forestry, Fisheries and Wildlife
University of Washington
Seattle, Washington 98195
U.S.A.

Telephone: (206) 543-1191

Director: B. A. Jayne

Project Duration: 1974-1977

Age: adult
Ability: above average
Subject: biol, phys, math, computer science, ecology
Language: English
Translations: none
Testing of Students: written achievement tests, teacher judgments, computer aided instruction problems

Materials Developed by Project:

Print	Non-Print
Programmed Units	Slides
Overview	Overhead Trans.
Intermediate Reports	Computer Programs

Types of Learning Experiences:

Lecture
Discussion
Simulations
Audio/Visual

PRINCIPAL PROFESSIONAL STAFF: Not answered

PROJECT HISTORY:

Reason(s) for Project Initiation: To develop instructional materials for students regarding quantitative analysis of physical processes in biology and ecology.

Evolution and Development of the Project: Project now in mid-stages of development. It is designed as a modular structure of teaching units oriented towards applications and understanding of physical processes in ecosystems. Teaching units include transparencies, slides, written materials and computer programs.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop written and other instructional materials so that students in the life sciences may become more adept in quantitative analysis of processes in biology and ecology.

Specific Objectives: Development and implementation of modular instructional materials is organized under the following areas: 1) Thermodynamics in Life Sciences; 2) Transport processes (a) Heat and Mass Transfer in Ecosystems and (b) Fluid Mechanics Related to Ecosystems; and 3) Mathematical Support Materials.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Primary student population is life scientists in the range from college junior through beginning graduate levels.

Ways in which it differs from similar or previous programs:

1. Advanced level program.
2. Emphasis is on quantitative aspects of ecosystem processes.
3. Applications oriented approach so that individual programmed units can be easily incorporated as an adjunct to existing courses.
4. Interdisciplinary Professional Staff (Forestry, Fisheries, Applied Mathematics, Computer Science, ...)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

All materials in developmental stage.

PHYSICAL PROCESSES IN TERRESTRIAL AND AQUATIC ECOSYSTEMS (2)

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

Computer Programs for Interactive Program Support, Problem-solving, Graphics, Data Manipulation.

Diffusion Processes in Forest Ecosystems, Fluid Mechanics for Aquatic Ecosystems, Introductory Concepts in Thermodynamics, and Numerical Applied Mathematics for Diffusion Applications.

TEACHER PREPARATION:

Consultant Services: Workshops to be organized after completion of project or during final stages. Consultations arranged and support activities to be organized in later stages of project.

Pre-service and In-service Training: Details not yet available.

Pre-service and In-service Teaching Materials: Materials not yet available.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Pertinent Research Studies:

P. Farnum and G. Carey (1975): Computer Simulation of Plug Seedling Survival Proc. Eng. Science Assn. Conference, Austin, Texas.

In-House or Unpublished Research: Research Studies in Diffusion in Terrestrial Ecosystems and in Thermodynamics. Class evaluations by project faculty.

Availability of Evaluative Data: Contact Project Director

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: New project not reported in 1974 Report

PLANS FOR THE FUTURE:

Continuing development in the areas noted above through the remainder of the project schedule.

PHYSICAL SCIENCE MODULES FOR BIOSCIENCE STUDENTS (PSMBS)

213 Ferguson Hall
University of Nebraska
Lincoln, Nebraska 68588
U.S.A.

Telephone: (4 2) 472-2790

Director: Robert Fuller

Project Duration: 1975-

Age: adult
Ability: all
Subject: chemistry, physics
Language: English
Translations: none
Testing of Students: written achievement tests

Materials Developed by Project:

Print	Non-Print
Overview	None

Types of Learning Experiences: Not answered

PRINCIPAL PROFESSIONAL STAFF:

Project Staff:
Robert G. Fuller, Project Director
Thomas C. Campbell, Assistant Editor
Stella M. Moline, Secretary

PROJECT HISTORY:

Evolution and Development of the Project:

The first National Steering Committee meeting was held in August, 1975. During this meeting decisions concerning the scope of the project were determined. The members will continue to function as a National Network for the evaluation and dissemination of the product materials. This project is supported by the National Science Foundation.

PROJECT OBJECTIVES:

Overall Project Purpose: The goal of the project is to produce modular instructional materials that illustrate applications of physical science principles for use in introductory college physics and chemistry courses populated by students interested in the biological, medical and allied health sciences.

This is a feasibility project to develop a system to infuse introductory college physics and chemistry courses with examples and applications drawn from the biological sciences including medicine and allied health.

The project will establish a system that will find these locally developed materials, review their quality, unify their format, test them in appropriate classroom situations, revise them if necessary and disseminate them nationally.

Specific Objectives: To produce:

1. A detailed exposition of the physical science needs of bio-science st ts in a number of selected content areas.
2. An annotated index of materials presently available in these selecte ent areas. The materials will be categorized by content and prerequisit ls.
3. A scheme for organizing modular materials appropriate for those selec content areas.
4. Two sample clusters (a total of 12 modules) illustrating appropriate content, approach, level quality, and organization.

PROJECT OBJECTIVES: (continued)

Specific Objectives: To produce:

5. An open system of participation for educators to foster the cooperative exchange of these materials.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Introductory college students.

Ways in which it differs from similar or previous programs: Faculty and others interested in teaching of physical science for bioscience students are invited to:

1. Submit materials which they have developed for teaching physical science content in bioscience related courses. Their materials will be classroom tested by other physical science educators providing valuable feedback. Revised materials will then receive national distribution under their authorship.
2. Assist the project in the identification and indexing of existing materials which they have found helpful in teaching bioscience courses.
3. Offer to field test materials developed by the project in the classroom and provide evaluation and revision suggestions.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Author's guidelines, preliminary modules on Osmosis and Thermal Processes in Living Systems.	not purchasable	N/A

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: All materials discussed in "Specific Objectives" above.

TEACHER PREPARATION:

Consultant Services: Instructor's workshops.

PROJECT EVALUATED:

Yes ____ No _X_ Internal ____ External Agency ____

PROJECT PUBLICITY: Not answered.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered.

PLANS FOR THE FUTURE: Not answered.

PHYSICS 111 X

Physics Department
University of Illinois
Chicago Circle
Chicago, Illinois 60680
U.S.A.

Telephone: (312) 996-3416/3400

Director: E. B. McNeil

Project Duration: 1975 -

Age: 18 +
Ability: all
Subject: phys
Language: English
Translations: None
Testing of Students:
written achievement tests
oral tests

Materials Developed by Project:

Print	Non-Print
Activity Sheets	Computer Assisted Instruction Programs
Eval. Materials	
Behavioral Objectives	
Overview	

Types of Learning Experiences:

Independent Study
Lab Activities
Computer Assisted Instruction

PRINCIPAL PROFESSIONAL STAFF:

E. B. McNeil, Director

PROJECT HISTORY:

Principal Initiator(s): E. B. McNeil

Reason(s) for Project Initiation: To improve student grades in physics and to adapt partially to student needs.

Evolution and Development of the Project:

Preliminary Planning - 1973-1974
Mark I - Spring 1975
Mark II - Fall 1975
Mark III - Winter 1976
Mark IV - Spring 1976

PROJECT OBJECTIVES:

Overall Project Purpose: To improve the performance of students in the first term of elementary university physics.

Specific Objectives:

1. To develop specific objectives for mechanics.
2. To discover gaps in standard textbook coverage.
3. To develop materials to cover those gaps.
4. To find or write special materials for slow or fast students.
5. To devise a management system which works but doesn't cost much.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Urban population at the introductory college level at a public university.

Ways in which it differs from similar or previous programs: This project has more detailed and specific objectives as well as being a personalized system including extensive Computer Assisted Instruction Units.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Study Guides	Free	Physics 111 X
Quizzes	Free	Physics 111 X
Final Exam	Free	Physics 111 X
Student Instructions	Free	Physics 111 X
Proctor's Guide	Free	Physics 111 X
Commentary on Computer Assisted Instruction Lessons	Free	Physics 111 X
Special Handouts	Free	Physics 111 X

PHYSICS 111 X (2)

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: See MATERIALS ALREADY PRODUCED

ADDITIONAL MATERIALS BEING DEVELOPED: Special exercises in problem-solving skills.

TEACHER PREPARATION:

Consultant Services: At present used only on campus.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

PROJECT PUBLICITY: None

PROJECT ACTIVITIES SINCE 1974 REPORT: N/A

PLANS FOR THE FUTURE:

Completion of mechanics materials and production of materials for second quarter.

PRESUMPSCOT RIVER EDUCATION PROGRAM FOR AWARENESS OF THE REGIONAL ENVIRONMENT (PROJECT PREPARE)

Center for Research and Advanced Study
University of Maine at Portland-Gorham
246 Deering Avenue
Portland, Maine 04102

Telephone: (207) 773-2981

Director: Dean B. Bennett

Project Duration: 1974-1975

Age: 15-18
Ability: average
Subject: biol, chem, phys
Language: English
Translations: None
Testing of Students:
  teacher judgments
  student attitude q're

Materials Developed by Project:

Print	Non-Print
Research Report Student Study Manual	

Types of Learning Experiences:

- Lecture
- Seminar
- Independent Study
- Lab Activities
- Discussion

PRINCIPAL PROFESSIONAL STAFF:

Samuel Zaitlin, Environmental Education Coordinator.

PROJECT HISTORY:

Principal Initiator: University of Maine at Portland-Gorham, Center for Alternative and Experimental Programs.

Reason(s) for Project Initiation: Need for a watershed approach to environmental studies and solutions to some environmental problems.

PROJECT OBJECTIVES:

Overall Project Purpose: To establish an effective environmental education program based on a watershed approach.

Specific Objectives:

1. To assist local lay citizens and community leaders in understanding the intricate ecological relationships within the Presumpscot River Watershed.
2. To develop a model approach for citizen involvement in watershed planning and management.
3. To assist schools to establish programs which relate their existing curricula to community and regional watershed problems.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Secondary school students - juniors and seniors, teachers, and adult decision-makers.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Presumpscot: A Profile of Estuarine Pollution and Recovery	not purchasable	
Student Study Guide: Water Quality Monitoring Approach to Watershed Studies	not purchasable	

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

The Center for Research and Advance Study has also been responsible for the Community Natural Resources Inventory Project which has produced:

PROJECT PREPARE (2)

ADDITIONAL MATERIALS BEING DEVELOPED: (continued)

1. Handbook - How to Do a Community Natural Resources Inventory
2. Community Inventory Manuals

TEACHER PREPARATION:

Consultant Services: Workshop teaching and ongoing assistance in water quality monitoring.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Pertinent Research Studies: Presumpscot: A Profile of Estuarine Pollution and Recovery.

PROJECT PUBLICITY:

"Soil Conservation" August 1975.

PROJECT ACTIVITIES SINCE 1974 REPORT: N/A

PLANS FOR THE FUTURE:

Continued dissemination of the project processes and products to stimulate similar activities in other Maine watersheds.

PRIMARY ENVIRONMENTAL EDUCATION PROJECT (PEEP)

206 Dudley
University of Georgia
Athens, Georgia 30602
U.S.A.

Telephone: (404) 542-7266

Directors: Everett T. Keach, Jr.
Elmer Williams

Project Duration: 1972-1973

Age: 5-9
Ability: all
Subject: envir. ed.
Language: English
Translations: none
Testing of Students:
written achievement tests (yes-no forced choice)

Materials Developed by Project:

Print	Non-Print
Activity Sheets	None
Tchr. Manuals	
Eval. Materials	
Behavioral Objectives	
Overview	

Types of Learning Experiences:
Discussion
Independent Study
Lab Activities
Field Experiences

PRINCIPAL PROFESSIONAL STAFF: Not answered

PROJECT HISTORY:

Principal Initiator(s): Dr. Everett T. Keach, Jr.
Dr. Elmer Williams

Reason(s) for Project Initiation: Need for environmental education for primary children.

Evolution and Development of the Project:

1. Funded in 1972 by the Office of Environmental Education, HEW
2. Nine modules developed by teachers, parents, social studies and science curriculum personnel, University of Georgia's Institute of Ecology personnel.
3. Field tested and evaluated during 1973 in the primary grades of the school system of Clarke County, Georgia.

PROJECT OBJECTIVES:

Overall Project Purpose: To introduce a process-oriented, interdisciplinary approach to environmental education into primary level classrooms.

Specific Objectives:

1. To develop a conceptual framework for environmental education for young children;
2. To structure an "action-oriented" program for this age level rather than the existing "awareness-oriented" programs;
3. To develop productive problem-solving skills; and
4. To incorporate significant ecological and environmental management concepts into the total curriculum of the primary school.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students in grades K-3 of all socio-economic levels. Reading is not a prerequisite skill for the program. Materials generalizable to all cultures interested in developing an environmental ethic in young children.

Ways in which it differs from similar or previous programs:

1. Generalizable to all cultures;
2. Modules can be used separately or in sequence; and
3. No (or little) materials costs.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Teachers' Guide for the Nine Modules	$1.25*	PEEP
Modules for Six Year Olds		
1. A Look at the Land	1.25	PEEP
2. Water-Support for Man's Activities	1.25	PEEP
3. Air-Support for Man's Activities	1.25	PEEP
Modules for Seven-Year-Olds:		
4. Solid Waste Disposal	1.25	PEEP
5. Walter Pollution	1.25	PEEP
6. Air Pollution - A Threat to Mankind	1.25	PEEP
Modules for Eight-Year-Olds:		
7. Interdependence in the Environment	1.25	PEEP
8. Management of Water Resources	1.25	PEEP
9. Protecting Our Air Resource	1.25	PEEP

*If the entire nine modules are purchased, the Teachers' Guide is free, making the purchase cost $10.00.

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

1. Module for 6-7-8-Year-Olds on energy
2. Module for 6-7-8-Olds on endangered species.
3. An evaluation instrument for measuring the affective impact of the materials.

TEACHER PREPARATION:

Consultant Services: For the most part, PEEP materials do not require in-service teacher training. Consultants, however, are available.

Pre-service and In-service Training: At present, workshops focused upon PEEP have been financed by the local school systems.

Pre-service and In-service Teaching Materials: Not necessary for this curriculum.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency X

Name of Outside Evaluators: Office of Environmental Education HEW

Pertinent Research Studies: One dissertation.

Availability of Evaluative Data: Final report can be obtained from PEEP office at 50¢/copy.

PROJECT PUBLICITY:

Keach, E.T. and E.D. Williams. Environmental Education For the Primary Level: The Process Dimension, Georgia Social Science Journal, Vol. V, No. 1, Fall 1973, pp. 1-16

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

PROBLEM-ORIENTED PHYSICS INSTRUCTION

Physics Department
Michigan State University
East Lansing, Michigan 48824
U.S.A.

Telephone: (517) 353-2047

Director: Peter Signell

Project Duration: 1975-1976

Age: 18+
Ability: all
Subject: physics
Language: English
Translations: none
Testing of Students:
written achievement tests,
lab performance tests,
oral tests

Materials Developed by Project:

Print	Non-Print
Eval. Materials Behavioral Objectives Overview Newsletters Lecture-length instructional modules	None

Types of Learning Experiences:
Not answered

PRINCIPAL PROFESSIONAL STAFF:

N. Frank Six; Chairman, PHYSMOD Consortium
L. David Roper; Chairman, ABP Task Force
Lester Paldy; Chairman, IOM Task Force

PROJECT HISTORY:

Principal Initiator(s): Peter Signell

Reason(s) for Project Initiation: Need for materials which allow the development of more efficient problem-solving instruction.

PROJECT OBJECTIVES:

Overall Project Purpose: To produce prototypes of the next generation of instructional materials in physics, emphasizing: (1) efficiency of instruction; and (2) problem-solving skills for the pure and applied sciences.

Specific Objectives: To produce models of instructional modules, author's guide, reviewers' guides, editors' guides, retrieval system, and interfacing system.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: College-level learners.

Ways in which it differs from similar or previous programs:

1. Lecture-length self-contained modules
2. A 5-level review system for each module
3. Acceptance of four different types of modules
4. Extensive planning for module interfacing and retrieval
5. Overall system design for flexibility and adaptability by instructors and/or learners.
6. Design characteristics include recent findings in educational and psycholinguistic research.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: None

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

PROBLEM-ORIENTED PHYSICS INSTRUCTION (2)

ADDITONAL MATERIALS BEING DEVELOPED:

1. Author's Handbook
2. Modules for instruction at all levels of physics, but currently mostly in General Physics

TEACHER PREPARATION:

Consultant Services: Each module has a listed "correspondent".

Pre-service and In-service Training: Workshops at national A.A.P.T. meetings.

PROJECT EVALUATED:

Yes ____ No X Internal ____ External Agency ____

Pertinent Research Studies: None

In-House or Unpublished Research: None

Availability of Evaluative Data: Write to: N. Frank Six, Chairman
PHYSMOD Consortium
Western Kentucky University

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

THE PROCESS MODULES FOR INVESTIGATING ENVIRONMENTAL PROBLEMS

Science Education Center -
Curriculum, Instruction, & Media
College of Education
Southern Illinois University
Carbondale, Illinois 62901
U.S.A.

Telephone: (618) 536-2047

Directors: Harold R. Hungerford
Ralph A. Litherland

Project Duration: 1973-1975

Age: 10-14
Ability: average, above average
Subject: envir. ed.
Language: English
Testing of Students: teacher judgments, contract with student for autonomous research

Materials Developed by Project:

Print	Non-Print
Textbooks	Lab Equipment
Behavioral Objectives	
Contracts	

Types of Learning Experiences:

- Independent Study
- Lab Activities
- Field Experiences
- Simulations

PRINCIPAL PROFESSIONAL STAFF:

Harold R. Hungerford
Ralph A. Litherland

PROJECT HISTORY:

Principal Initiator(s): Harold R. Hungerford
Ralph A. Litherland

Reason(s) for Project Initiation: Research indicated need for providing training in cognitive process skills prior to allowing middle school students to engage in autonomous research in environmental education.

Evolution and Development of the Project: Two trial editions. Final edition 1975. Printing costs paid for by developers.

PROJECT OBJECTIVES:

Overall Project Purpose: To develop autonomous learners in the area of environmental education. This goal necessitated the teaching of cognitive process.

Specific Objectives: Specific behavioral objectives are given for each module.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All socio-economic levels and cultural groups in grades 5-9 with the exception of those students in any group who are poor readers. The materials necessitate at least minimal reading skills. This problem has been only marginally solved.

Ways in which it differs from similar or previous programs: No program exists which is primarily concerned with the development of autonomous learners in environmental education. This program focuses on this issue and students participate in autonomous research after the completion of Modules I - IV (via a contract between student and teacher).

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Student Edition: Process Modules for Investigating Environmental Problems	$2.00	Project Director
Teachers' Edition: Process Modules for Investigating Environmental Problems	$2.00	Project Director

PRESENT COMMERCIAL AFFILIATIONS: None

THE PROCESS MODULES FOR INVESTIGATING
ENVIRONMENTAL PROBLEMS (2)

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

A new set of modules to develop the skills inherent in "Environmental Action" are being developed. These are tentatively being called the Environmental Action Modules.

TEACHER PREPARATION:

Consultant Services: All staff at the Science Education Center at SIU-C are available for workshops, consultation, etc. with respect to the modules. In-service teacher education has been conducted during 1975 and 1976 and will continue as long as there is a demand for same.

Pre-service and In-service Training: Depends entirely on the needs of the organization or school district. We have held workshops varying in length from two hours to two days. Workshops are also being held at professional meetings, e.g., NSTA, ISTA, SSMA, Nat. Middle School Assn. Costs are negotiable. Range from expenses to expenses plus honorarium which is usually determined by requesting agency.

Pre-service and In-service Teaching Materials: Descriptive papers are free. Modules and Teachers' Edition are $2.00 each.

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Pertinent Research Studies: Bisaga, Henry R. Middle School Students' Value Clarification in Environmental Education as a Function of Autonomous Research. Unpub. Masters Thesis, SIU-C, 1975.

In-House or Unpublished Research: Both pilot studies and the above research paper indicate that the number of discrete value positions regarding selected environmental issues increases as a function of autonomous research and that value positions do shift as a function of research into environmental issues (autonomously via the contract).

Availability of Evaluative Data: Yes, by special arrangement with the developers. Necessitates arranging for the Xeroxing of materials if hard data are desired.

PROJECT PUBLICITY:

Litherland, R. A. and Hungerford, H. R. "Process Modules for Investigating Environmental Science," Vol. 42, No. 6 (June 1975) The Science Teacher. 40.

Hungerford, H. R. "Myths of Environmental Education," The Journal of Environmental Education. (Winter 1975). 21-26.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE:

1. Materials will be turned over to reputable publisher whenever said publisher can be located.
2. Forthcoming materials include Environmental Action Modules.
3. A paradigm for environmental action is being utilized for said development.
4. A June 1976 institute at SIU-C is being held, a portion of which will be devoted to both the Process Modules and the Environmental Action Modules.

PROJECT ENRICH - THE USE OF VOLUNTEERS IN TEACHING ECOLOGY

Rocky River City School District
2985 Wooster Road
Rocky River, Ohio 44116
U.S.A.

Telephone: (216) 333-6000 EXT 222

Director: Peter M. Metro

Project Duration: 1974-1977

Age: 5-14, 16-adult
Ability: all, educable mentally retarded
Subject: ecology
Language: English
Translations: none
Testing of Students:
written achievement tests, student attitude q're, interest inventories, field observational behavioral analysis

Materials Developed by Project:

Print	Non-Print
Textbooks	Slide Tape
Lab Books	
Supplementary Books	
Tchr. Manuals	
Newsletters	

Types of Learning Experiences:
- Lab Activities
- Field Experiences
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

Mr. Peter M. Metro, Project Director

PROJECT HISTORY:

Principal Initiator(s): Rocky River City Schools

Reason(s) for Project Initiation: To meet the following critical needs:
Improvement of learning through altered staff training and utilization patterns.
Improvement of vocational and career education.
Improvement of student attitudes and skills in social and interpersonal problems.

Evolution and Development of the Project:

1. Internal critical needs assessment - 1973
2. Committee of citizens and public and non-public school teachers and administrators proposed the three year Title III project - January, 1974
3. Formal Title III proposal submitted to the Ohio State Department of Education - April, 1974
4. K - 12 curriculum development June, 1974 through January, 1976
5. Training of teachers and volunteers - September, 1974 through October, 1975
6. Continuous recruitment of volunteers - June, 1974 through March, 1976
7. Field testing of materials - October, 1974 through March, 1976

PROJECT OBJECTIVES:

Overall Project Purpose:

Increase students, teachers and citizens understanding of ecological studies
Improve techniques for recruitment, training, coordination and utilization of volunteers
Develop process oriented instructional materials for ecological studies K - 12
Encourage communication between teachers, students and citizens of the various public and non-public schools in the school district
Help students learn of the implications of ecology upon their future and their careers

Specific Objectives:

Maintain a minimum staff of 100 trained volunteers
Develop levels K-3, 4-6, 7-8, and 10-12 ecology materials (process oriented)
Develop an upper level educable mentally retarded (EMR) and adjusted learning program (ALP) ecology workbook

PROJECT ENRICH (2)

PROJECT OBJECTIVES:

Specific Objectives: (continued)

Develop a level 5 through adult text on the Rocky River Valley (a segment of the Cleveland, Ohio Metroparks). The text will stress the social and geological history of the valley.
Develop student produced ecology audio-tutorial materials
Maintain a staff of 100 trained volunteers to assist in the teaching process
Measure the participating student's increased respect for and understanding of his environment
Provide opportunities for high school students to have career experiences with professional ecologists
Measure the ability of students to apply process skills to the study of ecology
Measure teacher's ability to use developed ecology materials and volunteers
Measure teacher's confidence in using process materials in the study of ecology
Measure volunteer mastery of basic skills necessary for them to work with students and ecology materials

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population:

K - 12 Urban - Public and Non-Public Schools
Ability level - Above average with exception of EMR and ALP students.

Ways in which it differs from similar or previous programs:

Utilizes both adult and student volunteers in teaching and curriculum development
Permits groups of four to five students/instructor while in the field
Process oriented field activities developed for specific field study areas within the Cleveland, Ohio region

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Ecology Manual, Levels K-3 (140 pages)	$7.00	Project Director
Ecology Manual, Levels 4-6 (75 pages)	7.00	Project Director
Terrestrial Ecology Laboratory Manual, Levels 7-8 (131 pages)	6.50	Project Director
Aquatic Ecology Laboratory Manual, Levels 7-8 (65 pages)	4.50	Project Director
Field Ecology Laboratory Manual, Levels 10-12 (127 pages)	7.00	Project Director
EMR - ALP Ecology Workbook - Upper Level (188 pages)	10.00	Project Director
Rocky River Valley Test, This Glorious Mud Pile, Level range: 5 through adult (Social and Geological history of a segment of the Cleveland, Ohio Metroparks, contains narrative, student worksheets for specific stations and glossary) (83 pages)	7.00	Project Director
Maple Syruping - A pamphlet for levels 5 through adult (11 pages)	1.00	Project Director
Audio-tutorial Programs: "Camping" (Levels 5-6) "Glaciers" (Levels 5-9) "Weathering" (Levels 5-9) "Pond Development" (Levels 5-9) "Effects of Rocky River" (Levels 5-9) "Flood Plain Development" (Levels 5-9)	Not Purchasable	Not Applicable

PROJECT ENRICH (3)

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: Not clearly defined at this time.

TEACHER PREPARATION:

Consultant Services:

One hundred + trained volunteers
Eight curriculum writers (professional staff)
One Field Coordinator
One Project Director

Pre-service and In-service Training: Level K - 6 teachers are given an opportunity to take part in workshop programs on a released time basis - materials covered are field oriented. Financed through Title III funding.

Pre-service and In-service Teaching Materials: None specifically developed for pre-service or in-service.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency ___

Pertinent Research Studies: None

In-House or Unpublished Research:

Pre and post criterion referenced tests of K - 12 students selected at random
Log of student and volunteer involvement in ecology projects
Open-ended student questionnaires related to career interest and knowledge
Observational behavior analysis of students and volunteers while in the field
Workshop evaluation
Curriculum material evaluation

Availability of Evaluative Data: Not at the present time.

PROJECT PUBLICITY: None

PROJECT ACTIVITIES SINCE 1974 REPORT: Not applicable

PLANS FOR THE FUTURE: Not clearly defined at present.

PROJECT MER (MARINE ECOLOGY RESEARCH)

Project MER
Contra Costa County Superintendent
of Schools Office
75 Santa Barbara Road
Pleasant Hill, California 94523
U.S.A.

Telephone: (415) 937-4100 EXT. 368

Directors: Don Lundstrum
Bob Watanabe

Project Duration: Not answered

Additional information, see also 20-Year Cumulative Directory for title change.

Age: 13-18
Ability: all
Subject: biol, chem, marine science
Language: English
Translations: none
Testing of Students:
Student attitude q're

Materials Developed by Project:

Print
- Text Books
- Lab Books
- Supplementary Books
- Programmed Units
- Tchr. Manuals
- Eval. Materials
- Overview
- Newsletters
- Tests of Cognitive, Affective Growth

Non-Print
- Slides
- Audio-Tutorial Program

Types of Learning Experiences:
- Lecture
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

George Mamolito, Marine Sciences Trainer, Bob Watanabe, Associate Director, Deborah Shenfil, Assistant Trainer

PROJECT HISTORY:

Principal Initiator(s): Contra Costa County Board of Supervisors

Reason(s) for Project Initiation: Project MER, operated by the Contra Costa County Superintendent of Schools jointly with the Alameda County Superintendent of Schools and the Diocese of Oakland, was initiated to provide Bay Area Students with an opportunity to study marine ecology as part of their school curriculum and to participate in a series of ongoing scientific research studies of the San Francisco Bay-Delta-Estuary complex.

Evolution and Development of the Project: MER was first funded by the Contra Costa County Board of Supervisors from surplus Fish and Game Fine Funds. This was followed by a grant from the Rosenberg Foundation. In 1971-72, a National Science Foundation grant funded the project. An ESEA Title III grant provided continued support for three additional years, 1973-75. Participating schools provided supplies, transportation and substitute costs. The 12th Naval District makes the P.M.M.L. space available at a minimal least cost. The two county offices and the Oakland Diocese Department of Education have assisted by covering indirect costs of operation and publication costs.

PROJECT OBJECTIVES:

Overall Project Purpose: To supplement existing instruction in life sciences with a unit on marine ecology applicable to the San Francisco Bay-Delta-Estuary Complex. The instruction is designed to provide students with a factual background in science and develop positive attitudes toward their local aquatic environment.

Specific Objectives: Project MER is designed to supplement existing science programs and offers a program which includes instruction at a marine laboratory, and a complete 6 - 8 week curriculum unit The objectives include increasing student knowledge in this area and development of positive attitudes toward the

PROJECT MER (MARINE ECOLOGY RESEARCH) (2)

PROJECT OBJECTIVES:

Specific Objectives: (continued) marine environment. Curricular activities include student involvement in gathering data on the Bay to be utilized by local governmental agencies. Teacher training and the development of curricular materials are also part of the program.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: This program is a two-county program and is available to public and non-public schools in Alameda and Contra Costa Counties. As such, it provides for every possible socio-economic, cultural and intellectual background in grade 7-12.

Ways in which it differs from similar or previous programs: Project MER is a program designed by teachers in two counties to involve students in scientific research in the local aquatic environment. The scientific research design, prepared by Dr. Fred Tarp, Ph.D., is beginning to provide the people of the Bay Area with necessary biological information on the ecology of local waters. Students who have received training at the Point Molate Marine Laboratory participate in the program by collecting scientific data at various field stations located along the shores of the San Francisco Bay-Delta-Estuary Complex. Systematic monitoring of the waters by students is providing a baseline of data on the Bay waters which is presently unavailable elsewhere.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Marine Science Handbooks (Parts I-VI)	$3.90	Contra Costa County Supt. Schools Office 2371 Stanwell Drive Concord, California (checks to: Cty.Treas. and Tax Collector)
Guide to Marine Ecology Research (complete 6-8 wk. curriculum guide)	2.50	
Teachers' Supplement to the Guide	2.50	
Marine Ecology Research, Resource Units (Grades 7-9)	Not Given	

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE:

Abstract
General Information Sheet
Data Collection Forms
Field Research Design
Marine Science Inventory (Cognitive) Form A
Marine Science Inventory (Affective) Form B

ADDITIONAL MATERIALS BEING DEVELOPED:

Handbook, Part I (under revision)
Intermediate Unit (under revision)

TEACHER PREPARATION:

Consultant Services:
Inservice training at marine laboratory (1-5 days)
Consultant services at local field stations (as needed)

Pre-service and In-service Training: See "Guidelines for Visiting-Instructors", available from the Project.

PROJECT EVALUATED:

Yes X No _____ Internal _____ External Agency _____

Name of outside agency: Evaluation for ESEA, Title III,
Dr. William C. Theimer, 6448 Alexandria Place, Stockton, California 95207

PROJECT MER (MARINE ECOLOGY RESEARCH) (3)

PROJECT PUBLICITY:

American Education, Vol. 10, No. 1, pp 27-29
Outdoor California, Vol. 33, No. 1, p. 8

PROJECT ACTIVITIES SINCE 1974 REPORT:

Project presently funded through Alameda County Board of Supervisors and Contra Costa County Superintendent of Schools Office.

PLANS FOR THE FUTURE: Improvement of present program.

REGIONAL CENTER FOR PRE-COLLEGE MATHEMATICS CURRICULUM PROJECTS

Mathematics Laboratory
Department of Mathematics
University of Denver
Denver, Colorado 80210
U.S.A.

Telephone: (303) 753-3636

Director: Ruth I. Hoffman

Project Duration: 1972-1976

Age: 6-adult
Ability: all
Subject: math
Language: English
Translations: none
Testing of Students: written achievement tests, teacher judgments, student attitude q're

Materials Developed by Project:

Print	Non-Print
Supplementary Books	Slides
Activity Sheets	Slide Tape
Tchr. Manuals	Games
	Models
	Lab Equipment
	Modeling Activities

Types of Learning Experiences:
- Lab Activities
- Field Experiences
- Demonstrations
- Simulations

PRINCIPAL PROFESSIONAL STAFF:

Dr. Ruth Irene Hoffman, Director
Dr. Clarence Smith, Assistant Director
Mike Zastrocky, Computer Research Associate
Rick Yuskaits and Ruth Patton, Media Research Associates
Dorothea Pile, Lucy Groggin, and Louis Kavari, Editorial Associates

PROJECT HISTORY:

Reason(s) for Project Initiation: To develop material in modules incorporating media, computers, calculators, and math lab involvement materials.

Evolution and Development of the Project: Funded by the National Science Foundation; Established a network of 23 sattelite centers in the 8-state Rocky Mountain region.

PROJECT OBJECTIVES:

Overall Project Purpose: To involve more classrooms in active learning through modeling, experiments, activities.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Students, aged 6-adult of all ability levels in the 8-state Rocky Mountain region.

Ways in which it differs from similar or previous programs:
1. Established a network of 23 satellite centers; and
2. Developed involvement materials.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

A list of modules is available from the Project.

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

Audio-visual material: "What is a Math Lab?", "What is Mathematics?", "What is Mathematical Modeling?, "What is a Teacher Resource Center?", "Metric", "Hand-Held Calculators".

REGIONAL CENTER FOR PRE-COLLEGE MATHEMATICS CURRICULUM PROJECTS (2)

TEACHER PREPARATION:

Consultant Services: Consultants are available on individual, group, school district, short-term, long-term, class, contract or drop-in basis.

Pre-service and In-service Training: All kinds--funded by grant from the National Science Foundation.

Pre-service and In-service Teaching Materials: Contact project director for list of teacher training modules available.

PROJECT EVALUATED:

Yes X No ___ Internal X External Agency X

Name of Outside Evaluators: Metro Area Schools (Denver Area); 8 State Schools.

Pertinent Research Studies: None

Availability of Evaluative Data: None

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

SCIENCE FOR THE SEVENTIES AND INSTRUCTIONAL TELEVISION (SFTS-ITV)

320 Rackley Building
The Pennsylvania State University
University Park, Pennsylvania 16802
U.S.A.

Telephone: (814) 865-1500

Director: Paul W. Welliver

Project Duration: 1972 -

Additional information, see also
Clearinghouse Reports: 9

Age: 6-12
Ability: all
Subject: general elementary sci.
Language: English
Translations: none
Testing of Students: lab performance tests, televised tests

Materials Developed by Project:

Print	Non-Print
Supplementary Books	Videotape
Tchr. Manuals	
Eval. Materials	
Newsletters	

Types of Learning Experiences:

Discussion
Independent Study
Lab Activities
Field Experiences
Demonstrations
Televised Lessons

PRINCIPAL PROFESSIONAL STAFF:

Paul W. Welliver, Director
Dorothy Alfke (Development)
Robert Shrigley (Development)
Theodore Johnson (Development)
Michael Szabo (Evaluation)

PROJECT HISTORY:

Principal Initiator(s): Paul W. Welliver, Irvin Edgar

Reason(s) for Project Initiation: To implement contemporary approaches to elementary school science instruction in Pennsylvania

Evolution and Development of the Project: The project has spread from central Pennsylvania to be used throughout Pennsylvania.

PROJECT OBJECTIVES:

Overall Project Purpose: To make elementary school teachers aware of contemporary approaches to teaching science and to assist them in using these new approaches.

Specific Objectives:

1. To design a statewide instructional system using all available communications and educational channels to make a sudden, dramatic impact on elementary school science instruction.
2. To acquaint teachers with SFTS instructional resources.
3. To assist teachers in gaining skill appropriate to teaching inquiry oriented science.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All elementary school classrooms (grades K-6) throughout Pennsylvania. Some special work has been done with inner city blacks and with the mentally retarded.

Ways in which it differs from similar or previous programs: This project has a unique use of television in which children and teachers interact extensively during television programs which introduce extended science lessons.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
SFTS-ITV Handbook for Teachers	$3.00	SFTS-ITV
Ten SFTS-ITV Programs (Primary Level)	not purchasable	N/A
Ten SFTS-ITV Programs (Intermediate Level)	not purchasable	N/A
Seven ITV Teacher Orientation Programs	not purchasable	N/A
A TV Test of Science Processes	not purchasable	N/A

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVALIABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

Materials for other communications media and for publicity, dissemination, and teacher in-service.

TEACHER PREPARATION:

Consultant Services: Availability of project staff and availability of other representatives throughout Pennsylvania.

Pre-service and In-service Training: Materials provided to pre-service institutions ($3.00/school). In-service: TV Programs, Credit courses (tuition $45.00/credit), and Workshops.

Pre-service and In-service Teaching Materials: TV tapes (not available outside of Pennsylvania) and SFTS-ITV manuals ($3.00).

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

Name of Outside Evaluators: None

Pertinent Research Studies: None

In-House or Unpublished Research: Teachers using SFTS-ITV programs demonstrate verbal skills conducive to inquiry science more than teachers using SFTS lessons without TV.

Availability of Evaluative Data: SFTS-ITV Project Reports are available from the project office.

PROJECT PUBLICITY

Shrigley, Alfke, Szabo, Welliver. "SFTS-ITV: A Model for Implementing Statewide Curriculum Change." Science Education, 59(4): 499-503 (1975).

PROJECT ACTIVITIES SINCE 1974 REPORT:

Development of materials at intermediate level. Development of a TV test. Dissemination and in-service activities.

PLANS FOR THE FUTURE:

Expansion and dissemination to states other than Pennsylvania.

SELF PACED TUTORIAL COURSES FOR MINERAL SCIENCE-METALLURGY DEPARTMENTS

Montana College of Mineral Science
and Technology
West Park Street
Butte, Montana 59701
U.S.A.

Telephone: (406) 792-8321 Ext. 272

Director: L. G. Twidwell

Project Duration: 1975-1978

Age: adult
Ability: all
Subject: eng/tech
Language: English
Translations: none
Testing of Students: written achievement tests, teacher judgments, student attitude q're

Materials Developed by Project:

Print
- Programmed Units
- Activity Sheets
- Tchr. Manuals
- Eval. Materials

Non-Print
- Slides
- Films
- Videotape
- Slide Tape
- Audiotape

Types of Learning Experiences:
- Independent Study
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

Dr. L. G. Twidwell, Principal Investigator
Dr. T. O'Keefe, Unit Coordinator
Dr. J. Miller, Unit Coordinator
Dr. G. Martin, Unit Coordinator

PROJECT HISTORY:

Principal Initiator(s): Dr. L. G. Twidwell

Reason(s) for Project Initiation: To provide small metallurgy departments with resource material in the area of extractive metallurgy.

Evolution and Development of the Project: The materials to be prepared consist of four courses. Each course is being coordinated by an expert in the field.

PROJECT OBJECTIVES:

Overall Project Purpose: To prepare courses in the mineral engineering field with a self-paced tutorial format, and to evaluate student and instructor response to these courses.

Specific Objectives: To prepare modularized self-paced materials in four extractive metallurgy courses: Pyrometallurgy, Hydrometallurgy, Electrometallurgy and Metallurgical Kinetics.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Undergraduate junior and senior students in minerals engineering.

Ways in which it differs from similar or previous programs: There are no similar projects in the minerals engineering field.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

No materials presently available for distribution.

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

Four courses in: pyrometallurgy, hydrometallurgy, electrometallurgy and metallurgical Kinetics.

SELF PACED TUTORIAL COURSES FOR MINERAL SCIENCE-METALLURGY DEPARTMENTS (2)

TEACHER PREPARATION:

Consultant Services: For undergraduate students.

Pre-service and In-service Training: None

Pre-service Teaching Materials: None

PROJECT EVALUATED:

Yes _____ No X Internal _____ External Agency _____

Pertinent Research Studies: None

In-House or Unpublished Research: Abstracts and outlines of each course are established.

Availability of Evaluative Data: None

PROJECT PUBLICITY: None

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE:

Courses Ready for Student Use:

Pyrometallurgy	Jan. 1977
Hydrometallurgy	Sept. 1977
Electrometallurgy	Sept. 1977
Metallurgical Kinetics	Jan. 1978

SPATIAL ANALYSIS OF LAND USE PROJECT

Geography Department
Arizona State University
Tempe, Arizona 85281
U.S.A.

Telephone: (602) 965-3471

Director: John F. Lounsbury

Project Duration: 1975-1978

Age: adult
Ability: above average
Subject: geography
Language: English
Translations: none
Testing of Students:
written achievement tests,
lab performance tests,
oral tests,
teacher judgments

Materials Developed by Project;

Print	Non-Print
None to date	None to date

Types of Learning Experiences:

Lecture
Seminar
Discussion
Independent Study
Lab Activities
Field Experiences

PRINCIPAL PROFESSIONAL STAFF:

Dr. John F. Lounsbury, Geography Dept. Arizona State Univ., Director
Dr. Lawrence M. Sommers, Geography Dept. Michigan State Univ., Co-Director
Dr. Edward A. Fernald, Geography Dept. Florida State Univ., Co-Director
Faculty Developers: Drs. Michael Chubb, Robert I. Witlick, Michigan State Univ.; Drs. Frank T. Aldrich, Charles S. Sargent, Leo E. Zonn, Arizona State Univ.; Drs. Earl J. Baker, Donald J. Patton, Florida State Univ.

PROJECT HISTORY:

Principal Initiator(s): Drs. John F. Lounsbury, Lawrence M. Sommers and Edward A. Fernald.

Reason(s) for Project Initiation: The project was initiated to design a graduate-level program to train personnel capable of doing research at all scales, on land use analysis - one of the more pressing problems now facing the nation.

Evolution and Development of the Project: The project was developed after two years of conferences and meetings to design a program to bear on contemporary problems concerned with resource use.

PROJECT OBJECTIVES:

Overall Project Purpose: The purpose of this project is to develop a program at the master's level to train personnel capable of doing research on the spatial analysis of land use.

Specific Objectives: The program will focus on: (1) techniques concerned with the acquisition of raw land use data, including field methodologies and use of remote sensing data, etc; (2) methods of processing data, including computer analysis and computer graphics; (3) existing institutional frameworks within which land use policy decisions are made such as federal, regional, state, and local guidelines and legislation; and (4) research design appropriate for the analysis of land use problems. Emphasis will be on the contribution which the application of geographic research methodology can make to the realization of these program objectives.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: It is intended that the developed program will serve as a model to be adopted, in part or in total, by other universities and colleges. Further, it is hoped that the program will be recognized by federal, state and local agencies as well as private firms and consulting agencies as viable and sound training for persons to be employed at the operational or policy levels dealing with land use analysis.

UNIQUE CHARACTERISTICS OF THE PROJECT: (continued)

Ways in which it differs from similar or previous programs: The program will be developed by the cooperative efforts of three universities: Arizona State University, Florida State University, and Michigan State University. The program will be based in the Departments of Geography in each of the three institutions but will draw on the relevant expertise in other academic units at the respective universities. The program will become a major new option in the existing Master of Arts degree programs.

The program design is being jointly developed by six faculty developers, two from each university, and an Advisory Committee composed of individuals, most of whom are presently associated with private or governmental agencies. The members of the Committee represent a wide diversity of land use interests and professional training - law, planning, land management, area development, urban affairs, agriculture and finance.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: None to date

PRESENT COMMERCIAL AFFILIATIONS: None to date

MATERIALS AVAILABLE FREE: None to date

ADDITIONAL MATERIALS BEING DEVELOPED:

A printed booklet describing the program, objectives, goals and course offerings, including a syllabus of each of the courses, will be prepared and distributed to all pertinent academic departments and will be available in the spring of 1977 upon request to other groups or individuals.

TEACHER PREPARATION:

Consultant Services: None at present. Will have a consulting or advisory mechanism in 1977.

Pre-service and In-service Training: None at present

Pre-service and In-service Teaching Materials: None at present

PROJECTED EVALUATED:

Yes _____ No __X__ Internal _____ External Agency _____

When materials are developed they will be evaluated by CIRCE, Univ. of Illinois.

In-House or Unpublished Research: The subject matter, concepts and skills to be included in the program have been defined and the course formats have been tentatively determined.

PROJECT PUBLICITY:

Spatial Analysis and Land Use Project, Association of American Geographers' Newsletter, Vol. 10, No. 9, November 1975 & Graduate Programs Stated in Land-Use Analysis, Higher Education and National Affairs, Vol. 24, No. 49.

PROJECT ACTIVITIES SINCE 1974 REPORT:

The project is in the advanced planning stage at the present time. The Faculty Developers have had several meetings, but only one meeting of the Advisory Committee and Faculty Developers has been held to date. The subject matter, concepts and skills to be included in the program have been defined and the course formats have been tentatively determined.

PLANS FOR THE FUTURE:

The program will be designed and developed during the 1975-1976 academic year. Meetings of the Faculty Developers and the Advisory Committee will be held to refine the objectives of the program, determine program content, design courses, and to crystallize the structure of the program. During the 1976-1977 academic year, the pilot program will be offered at the three universities.

STRUCTURING MATHEMATICS FOR INDIVIDUALIZED LEARNING EXPERIENCES (SMILE)

Sandusky County Schools
1236 Napoleon Street
Fremont, Ohio 43420
U.S.A.

Telephone: (419) 334-2660

Director: R. L. Hills

Project Duration: 1973-1976

Age: 5-12
Ability: all
Subject: math
Language: English
Translations: none
Testing of Students:
standardized tests,
student attitude q're

Materials Developed by Project:

Print	Non-Print
Activity Sheets	Slides
Overview	Overhead Trans.
Newsletters	Games
Charts	Models
Student Attitude Scales	Lab Equipment
Variety of Math Learning Activities Packaged as Folders, Envelopes, Boxes, etc.	

Types of Learning Experiences:

- Lecture
- Discussion
- Independent Study
- Lab Activities
- Demonstrations
- Simulations
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF:

Marian Binder, Program Specialist
Hilda Anuskiewicz, Program Specialist
Janice Suffecool, Program Specialist

PROJECT HISTORY:

Principal Initiator(s): R. L. Hills

Reason(s) for Project Initiation: To meet pupil needs in learning mathematics.

Evolution and Development of the Project:

1. First year - K-3 Limited number of volunteer teachers
2. Second year - 4-6 Limited number of volunteer teachers
3. Third year - K-6 Other volunteer teachers not previously served
4. Annual evaluation of project impact
5. Third year control group evaluation design

PROJECT OBJECTIVES:

Overall Project Purpose: To explore and develop effective methods of individualizing the teaching of basic mathematical skills.

Specific Objectives:

1. Teachers, K-6, in project schools, after participating in training sessions conducted by project personnel, will demonstrate knowledge and understanding of individualized learning experiences to teach basic mathematical skills, and will exhibit more positive attitudes toward the teaching of mathematics.
2. Project personnel and participating teachers will design, develop, test and refine a Mini-Math Laboratory Model and accompanying programs of learning experiences for kindergarten through third grade and for grades 4-6, based upon individualized and personalized mathematics laboratory experiences.
3. Pupils (K-6) using individualized learning and personalized mathematics laboratory experiences will demonstrate increased achievement in mathematics, and will exhibit more positive attitudes toward the learning of mathematics.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: General population in grades K-6.

Ways in which it differs from similar or previous programs:

1. Intensive teacher involvement in production of instructional products.
2. Use of "Mini-Math Laboratory" learning center in each classroom provides a mechanism for individualized and small group learning.
3. Educational emphasis is shifted from blaming the pupil for his inadequacies to correcting inadequacies in teaching methods.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Pupil Task Cards: Primary Level, Intermediate Level and Metric	not purchasable	N/A
Game type learning activities for: Primary Level, Intermediate Level and Metric	not purchasable	N/A
Pupil Activity Sheets	not purchasable	N/A
Student Attitude Toward Mathematics Scale: Primary Level and Intermediate Level	not purchasable	N/A
Overhead transparencies for teacher use	not purchasable	N/A
"Math 4 Your Young 1's" (parent folder)	not purchasable	N/A
"Home Aid" Math Learning Game Activities	not purchasable	N/A
Mini-Math Laboratory (learning center model for classroom use)	not purchasable	N/A
Slide/tape presentation regarding project	not purchasable	N/A
Descriptive folder regarding project	Free	SMILE
Project Newsletters	Free	SMILE

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: Descriptive folder regarding project and newsletters.

ADDITIONAL MATERIALS BEING DEVELOPED:

A replication packet including samples of materials produced.

TEACHER PREPARATION

Consultant Services: Project staff provides in-school consultation and assistance limited to personal consultations with teachers, observations and critique of teaching practices, demonstration teaching, and occasional assistance with first attempts at grouping and individualization. Extra care is taken to avoid the introduction of a "second person variable" in the classroom.

Pre-service and In-service Training: Pre- and in-service training requires 10 workshop sessions (1½-2 hours each or equivalent). These are financed with federal grant funds at a total estimated cost of about $15 per teacher per session.

Pre-service and In-service Teaching Materials: Not applicable.

SMILE (3)

PROJECT EVALUATED: (In Process)

In-House or Unpublished Research: Annual project evaluation indicates substantial gains in pupil and teacher attitudes and teaching performance. Pupil achievement scores compare favorably with anticipated scores based upon pupil academic aptitude scores.

Availability of Evaluative Data: Contact project director.

PROJECT PUBLICITY: Not available.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Approximately 40 new teachers (K-6) have attended project workshops and have included some component(s) of the project in their instruction of mathematics. Extensive evaluation of project materials and practices is in process.

PLANS FOR THE FUTURE:

By June, 1976, sample replication packets should be prepared and preliminary evaluation reports completed. Federal funding ceases after August 31, 1976. Phase-out activities will begin in late April.

STUDENT CONCERNED ABOUT TOMORROW'S ENVIRONMENT (SCATE)

Department of Public Instruction
Curriculum Division
Grimes State Office Building
Des Moines, Iowa 50319
U.S.A.

Telephone: (515) 281-3264

Director: Duane Toomsen

Project Duration: 1975-1978

Age: 13-18
Ability: all
Subject: soc. sci., envir. education
Language: English
Translations: none
Testing of Students: student attitude q're performance in state assembly

Materials Developed by Project:

Print	Non-Print
Eval. Materials Overview Newsletters	

Types of Learning Experiences:

Discussion
Field Experiences
Simulations

PRINCIPAL PROFESSIONAL STAFF:

Duane Toomsen, Project Director
Dr. Ronald Harshman, Project Coordinator
Harriette Lindberg, Project Intern
Richard Gage, Project Advisor

PROJECT HISTORY:

Principal Initiator(s): Duane Toomsen and Richard Gage

Reason(s) for Project Initiation: To provide active student involvement in investigating environmental problems and participating in the political processes necessary to implement solutions to those problems.

Evolution and Development of the Project:

1976-1977 Statewide Implementation of the Project.
1977-1978 Projected regional dissemination of the Project and of Project materials.

PROJECT OBJECTIVES:

Overall Project Purpose: To provide active student participation in the investigation of environmental issues and to develop active student participation in democratic political processes.

Specific Objectives:

1. Development of an education program to:
   a) help each student adopt a philosophy of life which views man "as a participant in resource use and conservation".
   b) assist the student in developing the decision-making skills necessary to implement a life style in harmony with that philosophy.
2. Development of an education program that emphasizes individual participation in the political process.
3. Development of a central resource materials, retrieval and dissemination system to facilitate communication with individual teachers about available resources and programs in environmental education.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Secondary students.

Ways in which it differs from similar or previous programs: Project SCATE is unique in its emphasis upon both active student participation in scientific investigation of environmental problems and in active participation in the political processes necessary to implement solutions to the problems investigated.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Curriculum Guidelines for Project SCATE	Free	SCATE
Information Retrieval System Activities Manual	Free	SCATE
Resolutions for the State Assembly Project SCATE	Free	SCATE
Abstracts of ERIC documents related to educational activities in Air and Water Quality, Energy Allocation and Consumption, Land Use, and Economic Considerations Related to the Quality of Life.	Free	SCATE
"Energy Materials" 1973 K-12 Bibliography and model curriculum units for elementary, middle and high schools.	Free	SCATE

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: See above

ADDITIONAL MATERIALS BEING DEVELOPED:

Parliamentary Procedure Guidelines - shortform
Politics and the Environment - Project SCATE Evaluation Instrument
Exemplary Curriculum Units
Proceedings SCATE State Assembly

TEACHER PREPARATION:

Consultant Services: Resource materials retrieval system using computer based access to the ERIC system and workshop introduction to investigation procedures in Project SCATE and political participation.

Pre-service and In-service Training: Three day workshops are conducted to initiate participation of local districts. Workshops are conducted at resident camps at a cost of approximately $9.00 per person, per day. Workshops involve 80 people per workshop. They are held for the state.

PROJECT EVALUATED:

Yes _____ No X Internal _____ External Agency _____

Availability of Evaluative Data: Evaluation of the Project will be completed in Year 2. Report on the Pilot Year will be available later in the present year from this agency.

SCATE (3)

PROJECT PUBLICITY: None to date

PROJECT ACTIVITIES SINCE 1974 REPORT:

October, 1975 - Workshops conducted for 5 Area Education Agencies participating in the pilot year.
January, 1975 - Regional SCATE Assemblies.
February 13-14, 1976 - Pre-Plenary and Plenary SCATE Assemblies.

PLANS FOR THE FUTURE:

Implementation Statewide beginning June 1, 1976.
January and February, 1977 - Second SCATE Regional and State Assemblies.
June, 1977 - Development of model Project SCATE curriculum materials and Project Evaluation.

SUCCESS IN MATHEMATICS THROUGH AURAL READING TECHNIQUES (SMART)

Jack Duncan
Box 1910
Daytona Beach, Florida 32015
U.S.A.

Telephone: (904) 255-6475

Director: Frank Sganga

Project Duration: 1967 -

Additional information, see also Clearinghouse Reports: 9

Age: 11-12
Ability: all
Subject: math
Language: English
Translations: none
Testing of Students: written achievement tests, standardized tests

Materials Developed by Project:

Print	Non-Print
Lab books	Audiotape
Programmed Units	Games
Tchr. Manuals	Lab Equipment
Eval. Materials	
Overview	
Charts	

Types of Learning Experiences:

Independent Study

PRINCIPAL PROFESSIONAL STAFF:

Frank Sganga, Director
Jack Duncan, Manager
Joe Van Hoot, Training Specialist

PROJECT HISTORY:

Principal Initiator(s): Frank Sganga

Reason(s) for Project Initiation: Individualized math instruction.

Evolution and Development of the Project:

1. Pilot 1967
2. Operational 1970
3. Validation 1973
4. Demonstration/Distribution 1973-1976

PROJECT OBJECTIVES:

Overall Project Purpose: To individualize mathematics to allow student to proceed at a rate commersurate with his/her ability.

Specific Objectives:

1. The 5th and 6th grade students will be able to use computational skills more nearly commensurate with their aptitude as evidenced by pre-post test gains of the Stanford Math Achievement Tests when compared with a control group.
2. The 5th and 6th grade students will be able to use computational skills more nearly commensurate with their aptitude as evidenced by pre-post test gains of the Math Symbols and Vocabulary Test when compared with a control group.
3. The 6th grade students will be able to use computational skills more nearly commensurate with their aptitude as evidenced by pre-post gains on the Volusia County Math Survey when compared with a control group; the general ability of the experimental and control groups will be measured by the Toga Test.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Fifth and sixth graders of all backgrounds.

Ways in which it differs from similar or previous programs: SMART is funded by Title IV/Part C and is a non-profit organization and therefore is able to offer materials at an 'at cost' basis.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Student Study Booklets ($.25 for each non-expendable booklet and $.10 for each expendable booklet)	$.10 or $.25	SMART
Corresponding Cassette Tapes	$1.50 each	SMART
Teacher's Key	Free	SMART
Teacher's Manual	Free	SMART
Tests	Free	SMART
Progress Sheets	Free	SMART

PRESENT COMMERCIAL AFFILIATION: None

MATERIALS AVAILABLE FREE: See Materials Already Produced above.

ADDITIONAL MATERIALS BEING DEVELOPED: Training Manual.

TEACHER PREPARATION:

Consultant Services: Teachers are requested to come to Daytona Beach for 2 to 3 days training, one day to be spent on awareness, one on visiting demonstration schools, and one day interning in a demonstration school. Schools implementing Project SMART are visited for technical assistance.

Pre-service and In-service Training: As described above. There is no charge.

Pre-service and In-service Teaching Materials: None as yet.

PROJECT EVALUATED:

Yes X , No ____ Internal ____ External Agency X

Name of Outside Evaluators: University of Georgia

Availability of Evaluative Data: Dissemination materials sent to interested individuals upon request.

PROJECT PUBLICITY: Florida Schools Feb. 1975.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered.

PLANS FOR THE FUTURE: Unable to provide reliable information at this time.

TECH PHYSICS PROJECT (PRODUCT: PHYSICS OF TECHNOLOGY MODULES)

Physics Department
Indiana State University
Terre Haute, Indiana 47809
U.S.A.

Telephone: (812) 232-6311, EXT. 5355

National Coordinator: P. DiLavore

Project Duration: 1971-1974

Additional information, see also Clearinghouse Reports: 9 and the 20-Year Cumulative Directory for title change.

Age: 18+
Ability: all
Subject: physics
Language: English
Translations: none
Testing of Students: not answered

Materials Developed by Project:

Print	Non-Print
Textbooks	Filmloops
Lab Books	Lab Equipment
Tchr. Manuals	
Eval. Materials	
Behavioral Objectives	

Types of Learning Experiences:
- Lecture
- Discussion
- Independent Study
- Lab Activities
- Demonstrations

PRINCIPAL PROFESSIONAL STAFF:

Florissant Valley Community College St. Louis, Missouri:
Bill G. Aldridge, Project Director
Ralph L. Barnett, Jr.
Donald R. Mowery
Gary S. Waldman
Lawrence J. Wolf
John T. Yoder
Arnold B. Arons
Steven G. Sanders

Technical Education Research Centers, Cambridge, Massachusetts:
John W. McWane, Project Director
Nathaniel Frank, Principal Investigator
Ernest Klema, Principal Investigator
Richard Lewis
Dana Roberts
Malcolm Smith
Robert Tinker

Special Training Division, Oak Ridge Associated Universities, Oak Ridge, Tennessee:
Lawrence K. Akers, Project Director
John F. Yegge, Project Co-director
John Amend
Howard Dickson
Jerry Minter

State University of New York at Binghamton, Binghamton, New York:
Carl R. Stannard, Project Co-director
Bruce B. Marsh, Project Co-director
Arnold Benton
Giovanni Impeduglia
Gabriel Kousourou
John Ouderkirk
Arnold Strassenberg
Malcolm Goldberg
Ludwig Lange

PROJECT HISTORY:

Principal Initiator(s): Arnold Strassenberg, Bill Aldridge

PROJECT HISTORY: (Continued)

Evolution and Development of the Project: In 1971 support was granted by the National Science Foundation to four developmental groups, working under the umbrella of a National Steering Committee and administered by the American Institute of Physics. The primary function of the steering committee was to monitor the output of the production centers.

PROJECT OBJECTIVES:

Overall Project Purpose: To produce instructional materials for the teaching of introductory college physics in a "modular" form, and with a laboratory oriented approach.

Specific Objectives: To make the materials relevant and concrete, as viewed by the student; To develop the abstract concepts of physics from the practical applications; To develop laboratory experiments using low-cost, practical, technical, or every-day devices from which to extract the physics; and, To develop these materials in a modular format that will maximize the flexibility with which the instructor and the student can approach the course.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Originally the project was designed for two-year technical students, but has broadened to all colleges and some high schools.

Ways in which it differs from similar or previous programs:

1. Investigation of practical devices for the development of abstract concepts;
2. Modular format for maximum flexibility allows instructor to select areas of physics to be covered.
3. Attempt is made to begin each module at a level where the student can draw on previous experience; and
4. Laboratory uses common or technical devices to extract the physics, e.g. toaster, guitar, laser, etc.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Modules	Cost	Source
Analytical Balance (Measurement, Errors and Mechanical Equilibrium)	Not Given	McGraw-Hill
Automobile Collisions (Momentum and Energy)	$2.50	McGraw-Hill
Automobile Ignition Systems (Electricity and Magnetism)	Not Given	McGraw-Hill
Binoculars (Waves and Optics)	Not Given	McGraw-Hill
Camera (Optics and Photographic Measurements)	Not Given	McGraw-Hill
Cathode Ray Tube (Electric Fields and Forces)	Not Given	McGraw-Hill
Cloud Chamber (Detection of Radiation and Phase Changes)	Not Given	McGraw-Hill
Electric Fan (Rotational motion)	$2.50	McGraw-Hill
Fluorescent Lamp (Atomic physics)	Not Given	McGraw-Hill
Geiger Counter (Electrostatics and the Detection of Radioactivity)	Not Given	McGraw-Hill
Guitar (Wave Motion and Sound)	$2.75	McGraw-Hill
Hydraulic Devices (Hydraulics and Equilibrium)	$2.50	McGraw-Hill
Incandescent Lamp (Thermodynamics, Current, Electricity, and Photometry)	Not Given	McGraw-Hill
Laser (Modern Optics and Quantum Mechanics)	Not Given	McGraw-Hill
Loudspeaker (Sound)	$2.50	McGraw-Hill
Multimeter (Current Electricity)	Not Given	McGraw-Hill
Photodetectors (The Interaction of Light and Matter)	$2.75	McGraw-Hill
Pile Driver (Kinematics, Work and Energy Transformations)	$1.95	McGraw-Hill
Power Transister (Heat Transfer)	Not Given	McGraw-Hill
Pressure Cooker (Thermal Properties of Matter)	Not Given	McGraw-Hill

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Modules	Cost	Source
Slide Projector	$2.75	McGraw-Hill
Solenoid (Magnetism)	Not Given	McGraw-Hill
Spectrophotometer (Geometrical and Physical Optics)	$2.50	McGraw-Hill
Stroboscope (Kinematics)	$2.50	McGraw-Hill
Toaster (Heat and Energy Transformations)	Not Given	McGraw-Hill
Torque Wrench (Strains and Torques)	$2.25	McGraw-Hill
Transformer (Magnetic Properties of Matter and Alternating Currents)	$2.50	McGraw-Hill
Instructor's Manual	$2.95	McGraw-Hill

PRESENT COMMERCIAL AFFILIATIONS:

McGraw-Hill Book Company (Texts)
New York, New York

and

Thornton Associates (Apparatus)
87 Beaver Street
Waltham, Massachusetts 02154

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED:

Californium 252 (Nuclear Physics)
The Electric Eye Control (Modern Optics and Photometry)
The Gamma-Ray Spectrometer (Gamma Rays and Matter)
The Ionization Chamber (Electrostatics and the Detection of Radioactivity)
The Management of Nuclear Data (Measurement and Error)
Meter Movements (Equilibrium and Electromagnetism)
Motors and Generators (Energy Conservation and Electromagnetism)
The Strip-Chart Recorder (Mechanical Oscillations and Resonance)
The Thermostatically Controlled Heating System (Heat Transfer, Heat Measurement, and Thermal Properties of Matter)

TEACHER PREPARATION:

Consultant Services: None at present

Pre-service and In-service Training: None at present

Pre-service and In-service Teaching Materials: None at present

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency ____

PROJECT PUBLICITY:

DiLavore, F. 1973. Physics of Technology -- A Report of the Tech Physics Project. *The Physics Teacher*. 11:473.

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Not answered

UNIFIED SCIENCE AND MATHEMATICS FOR ELEMENTARY SCHOOLS (USMES)

Education Development Center
55 Chapel Street
Newton, Massachusetts 02160
U.S.A.

Telephone: (617) 969-7100 EXT. 571

Director: Earle L. Lomon

Project Duration: 1970-1977

Additional information, see also
Clearinghouse Reports: 9, 8

Age: 6-14
Ability: all, special education (gifted)
Subject: biol, chem, phys, math, technology, soc sci, language arts **consumer, career** & envir. ed.
Language: English
Translations: none
Testing of Students: lab performance tests, teacher judgments, student attitude q're, student reports, student experience charts

Materials Developed by Project:

Print	Non-Print
Supplementary Books	Slides
Tchr. Manuals	Videotape
Eval. Materials	Slide Tape
Overview	
Newsletters	
Charts	
Activity Cards	

Types of Learning Experiences:

- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Simulations

PRINCIPAL PROFESSIONAL STAFF:

Earle L. Lomon, USMES Project Director
Thomas L. Brown, Associate Director for Utilization Studies
Betty Beck, Associate Director for Development

PROJECT HISTORY:

Principal Initiator(s): Earle L. Lomon, Professor, Physics, M.I.T.

Reason(s) for Project Initiation: The USMES Project was initiated in response to the recommendations of the 1967 Cambridge Conference on the Correlation of Science and Mathematics in the Schools. The Conference strongly urged that the solving of real, practical problems become a central activity of elementary education.

Evolution and Development of the Project: Since its inception in 1970, USMES has been developing and carrying out field trials of interdisciplinary units which are based on long-range investigations of practical problems taken from the local school and community environment. The development work is carried out primarily by classroom teachers, assisted occasionally by university specialists. A variety of resource materials for students, teachers, and administrators are included in the curriculum.

PROJECT OBJECTIVES:

Overall Project Purpose: The USMES project is developing for use in elementary schools 26 interdisciplinary units, which provide opportunities for students to learn the process of solving practical problems while acquiring relevant skills. Activities revolve about statements called "challenges" which present practical problems on which children can carry out in-depth investigations.

Specific Objectives: The goal of the project is to develop and conduct field trials of 26 units to serve as examples of the real problem-solving style of learning. The units are to be models and the impetus for this type of learning to be taken up as a continuing effort in schools, but they will also be sufficient in number for school planners to design a curriculum for grades one to eight in which real problem solving plays an important role. A variety of resource materials designed to facilitate use of the program are under development.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Adaptable to students of all socio-economic levels, cross-cultural, and intellectual backgrounds in grades K-8.

Ways in which it differs from similar or previous programs: Because real problem solving is not an already established discipline in the schools, the resources that are developed are unique, and the strategies for developing these materials are also unique. Complex, long-range problem solving is a new area of learning. It integrates much of math, science, social science, and language arts, but does not belong to any one of these disciplines. It provides the opportunity for students to practice and develop specific skills in a meaningful context. It emphasizes student involvement in planning, decision making, and active group work. It requires the teacher to assume the special role of coordinator and facilitator.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Curriclum Correlation Guide	$1.50	USMES
Design Lab Slide/Tape Show	10.00	USMES
General Slide/Tape Show	10.00	USMES
Dice Design Shapes (to accompany Dice Design Unit)	30.00	USMES
Preparing People for USMES: An Implementation Resource Book	1.50	USMES
Complete USMES School Library:		
One each of the following:	83.00	USMES
USMES Guide	2.50	
USMES Design Lab Manual	3.00	
USMES Design Lab Manual Supplement	1.50	
Background Papers	8.50	
"How To" Cards (excluding Design Lab Cards)	8.50	
"How To" Cards for Design Lab	3.50	
Teacher Resource Books:		
Advertising	2.50	
Bicycle Transportation	2.50	
Burglar Alarm Design	2.50	
Classroom Design	2.50	
Classroom Management	3.00	
Consumer Research	2.50	
Describing People	2.50	
Designing for Human Proportions	2.50	
Dice Design	2.50	
Getting There	3.00	
Growing Plants	3.00	
Lunch Lines	2.50	
Manufacturing	2.50	
Orientation	3.00	
Pedestrian Crossings	2.50	
Play Area Design and Use	2.50	
School Zoo	3.00	
Soft Drink Design	2.50	
Traffic Flow	2.50	
Ways to Learn/Teach	3.00	
Weather Predictions	2.50	
Mass Communications	3.00	
Nature Trails	3.00	
School Supplies	3.00	
Informational Packet (Brochure; newspaper/magazine articles; USMES in the United States)	Free	USMES

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: Informational Packet (up to five free, then $.15 each).

ADDITIONAL MATERIALS BEING DEVELOPED:

Additional Teacher Resource Books (6)
"How To" Cards for primary grades
Evaluation instruments for problem-solving and resource materials on use
Broadcast-quality videotape series for teacher preparation
Resource materials for administrators on program operation
Revisions:
  on some of above resource books, based on documentation from 1975-76 teachers
  Background Papers
  "How To" Cards for intermediate grades
  Design Lab Manual
Expansion of Curriculum Correlation Guide

TEACHER PREPARATION:

Consultant Services: Network of university content/curriculum specialists and resource personnel from USMES resource teams throughout the U.S.

Pre-Service and In-service Training: Project does not do training. USMES is included in pre- and in-service college courses (college or NSF-funded). Informational meetings and teacher training workshops are also conducted by USMES resource teams (funded by local school districts or foundations).

Pre-service and In-service Teaching Materials: Preparing People for USMES: An Implementation Resource Book ($1.50) and Report on USMES College Courses

PROJECT EVALUATED:

Yes X No ____ Internal X External Agency X

Name of Outside Evaluators: School of Education, Boston University, Boston MA; Minnesota Research and Evaluation Project, University of Minnesota, Minneapolis.

Pertinent Research Studies:

Shapiro, B. May 1973 The Notebook Problem, Education Development Center, Newton, MA
Krairojananan, S. 1973. The Mathematical Behaviors Derivable From the Program of Unified Science and Mathematics for Elementary Schools. Doctoral Dissertation, Michigan State University, East Lansing, MI.

Shann, M., T. Aiello, and N. Reali, An Evaluation of USMES: Its Effects on Student Performance in Problem Solving and Basic Skills. Boston University School of Education, September 1974.
Shann, M. H., N.C. Reali, H. Bender, T. Aiello, L. Hench, Student Effects of an Interdisciplinary Curriculum for Real Problem Solving: The 1974-75 USMES Evaluation. Boston University, December 1975.
Summary of Evaluations on Effects of USMES. Education Development Center, Inc. 1976.

In-House or Unpublished Research: The evaluation of the effects of USMES is still in process. Results to date support all the basic assumptions of the instructional strategy and indicate that the materials adequately support those strategies. Tests of real problem solving abilities have indicated that USMES has a positive effect, but much work remains to be done on development of appropriate and easily used instruments. Results from standardized achievement tests in computation and reading indicate that USMES classes not only do as well but probably better than traditional classes in the key area of basics. Extensive interviews by outside evaluators and classroom activity analysis have confirmed that the USMES program strongly and suitably affects attitudes and behaviors.

PROJECT EVALUATED: (continued)

Availability of Evaluative Data: Available upon request from USMES Project.

PROJECT PUBLICITY:

How do you move a lunch line faster? Winter 1974. Mosaic. 15(1). National Science Foundation, Washington, D. C.
Real Problem Solving in USMES: Interdisciplinary Education and Much More. October 1974. School Science and Mathematics.
USMES--A Step Toward an Integrated Curriculum. January 1974. Learning, Vol. 2 Number 5.
Math and the Integrated Day. March 1976. Learning, Vol. 4 Number 7.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Classroom development of 5 units. Trial implementation of 9 units. Field trials of all 26 units. Development of cartoon-style "How To" Cards for primary grades. Preliminary edition of Curriculum Correlation Guide. Work on evaluation instruments. Data collection on USMES programs in schools and districts.

PLANS FOR THE FUTURE: Phase-out projected in 1977 or 1978.

UNIVERSE AND I (U&I)

Kentucky Educational Television
600 Cooper Drive
Lexington, Kentucky 40502
U.S.A.

Telephone: (606) 272-6371

Director: Robert Shy

Project Duration: 1973-1977

Age: 11-14
Ability: all
Subject: earth-space
Language: English
Translations: none
Testing of Students: written achievement tests, teacher judgments, student attitude q're, interest inventories

Materials Developed by Project:

Print	Non-Print
Activity Sheets	Films
Tchr. Manuals	Videotape
Eval. Materials	Games
Behavioral Objectives	
Overview	
Newsletters	

Types of Learning Experiences:

Discussion
Lab Activities
Televised Lessons

PRINCIPAL PROFESSIONAL STAFF:

Richard Smith, Writer
David Benjamin, Writer
Dorothy Peterson, Associate Producer
Sid Webb, Director of Production
Timothy Tassie, Project Coordinator
George Rasmussen, Television Producer-Director

PROJECT HISTORY:

Principal Initiator(s): Robert Shy
Wendell Cave

Reason(s) for Project Initiation:

Need for help in earth/space science teaching in Kentucky.
Existence of a state wide television network.

PROJECT OBJECTIVES:

Overall Project Purpose: The Primary Goals of U and I are:
To instill within students, constructive attitudes concerning the methods and major concepts of earth/space science.
To develop physical and mental skills necessary for scientific activity and thought.
To develop the major concepts of earth/space science which support and extend constructive attitudes and skills of science.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Junior high school teachers and students - all levels.

Ways in which it differs from similar or previous programs: This project makes use of television to stimulate student interest and change student attitudes towards earth/space sciences. The programs are geared to a structure which integrates earth and space sciences.

MATERIALS ALREADY PRODUCED:

1. Teacher's guide (includes inquiry activities).
2. 10 Television programs (also on film)
3. 10 Student supplements - comic format - one for each program.

#1A The Universe
#2A Halftime (Molecule) Show #2B (Resources) Jake's Gate
#3A Energy (Visit to Spectrum II) 3B Star Salesman
#4A (Atmospheres) Mindslaughter #4 (Winds of) Cannon Mountain #4C (Oceans)
#5A The Solar System #5B (The Changing Landscape)
#6A The Interior Motive #6B (Floating Continents) Chuckler

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

#7 (Relative Position and Motion) Vectoria #7B Time, Space and Relativity) Luna The Lovely
#8A The Gravity Drag #8B (Orbital Mechanics) Bulletin
#9A The Changing Scientist #9B (Origins) City of Fossils
#10A Scott (Life Support) Freezing Point #10B The Future

PRESENT COMMERCIAL AFFILIATIONS:

Agency for Instructional Television
Bloomington, Indiana 47101 (non-profit agency)

MATERIALS AVAILABLE FREE:

All available free in Kentucky - at cost out-of-state.

ADDITIONAL MATERIALS BEING DEVELOPED:

10 Additional programs and 10 student supplements as well as an expanded Teacher's guide are presently being produced.

TEACHER PREPARATION:

Consultant Services: Plans are presently being made for in State in-service Out-of-state in-service is available on a limited basis by request.

PROJECT EVALUATED:

Yes _____ No _____ Internal X External Agency _____

Availability of Evaluative Data: An interim report is available from:
Patricia Jones
Kentucky Educational Television
600 Cooper Drive
Lexington, Kentucky 40502

PROJECT PUBLICITY:

NAEB Instruction Newsletter
Council of State Science Supervisors Newsletter
NSTA Convention Programs
Agency for Instructional Television Newsletter

PROJECT ACTIVITIES SINCE 1974 REPORT: Not answered

PLANS FOR THE FUTURE: Completion of the project is expected by the first of 1977.

UPPER MISSISSIPPI RIVER ECO-CENTER DIFFUSION MODEL (TITLE IV ESEA)

Upper Mississippi River Eco-Center -
Diffusion
Educational Service Region
Court House
Mt. Carroll, Illinois 61053
U.S.A.

Telephone: (815) 244-1844

Director: Dennis Etnyre

Project Duration: 1975-

Additional information; see also Clearinghouse Reports: 9

Age: 9-11
Ability: not answered
Subject: envir. ed
Language: English
Translations: none
Testing of Students: Pre-Post

Materials Developed by Project:

Print	Non-Print
Tchr. Guide	Operation Awareness (canoe course)
Envir. Ed Curr. Guide (K-8)	6th Grade Land Use Study (field trip)
Language Arts Activities	
Bibliography of Envir. Ed Materials	

Types of Learning Experiences: not answered

PRINCIPAL PROFESSIONAL STAFF:

Bruce Floyd, Disseminator of Diffusion Project

PROJECT HISTORY:

Principal Initiator(s): The Upper Mississippi River Eco-Center

Reason(s) for Project Initiation: Need to train middle elementary school teachers in environmental education.

Evolution and Development of the Project: In first year of operation.

PROJECT OBJECTIVES:

Overall Project Purpose: The major objective of the Eco-Center program is the maintenance of a diffusion model for the State of Illinois. The model will aid Illinois school districts in adoption/adaption of the validated Title III ESEA Project: The Upper Mississippi River Eco-Center.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All school districts in grades 4-6 in the State of Illinois.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
Environmental Education - An Interdisciplinary Approach for the Intermediate Level. a 140 page Teacher's Guide including classroom and field activities with behavioral objectives and evaluation methods	$2.50	Eco-Center *
Environmental Education Curriculum Guide for K-8 An 84 page guide with sequentially developed concepts and activities in: air, land, water, animal life, plants, recreation	1.00	Eco-Center
Language in the Out of Doors - 17 relatively simple language arts activities	.50	Eco-Center
Sixth Grade Land Use Study - A day's field experience for sixth grade students studying land use of a private resort.	.50	Eco-Center
Bibliography of Environmental Education Materials	1.00	Eco-Center

UPPER MISSISSIPPI RIVER ECO-CENTER DIFFUSION MODEL (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS: (continued)

Material	Cost	Source
101 Environmental Activities (Entire set)	$3.00	Eco-Center
Separate Booklets:		
Art and Music	.50	
Language Arts	1.00	
Mathematics	.50	
Science	1.00	
Science and Social Studies (Interdisciplinary)	.50	
Social Studies	.50	
Operation Awareness - High School Canoe Camping Course	.50	Eco-Center
Program Brochure	.10	Eco-Center
Out Your Window Program for Third Graders	.25	Eco-Center
Fourth Grade Forest Study	.25	Eco-Center

*Upper Mississippi River Eco-Center
Thomson, Illinois 61285

PRESENT COMMERCIAL AFFILIATIONS: None

MATERIALS AVAILABLE FREE: None

ADDITIONAL MATERIALS BEING DEVELOPED: Not answered

TEACHER PREPARATION:

Consultant Services:

1. Personnel to present inservice training session.
2. Technical assistance in: program development, site selection, selection of reference materials, and writing objectives.

Pre-service and In-service Training:
Two all-day inservice training sessions at local district, financed by Title IV ESEA (Illinois only)

Pre-service and In-service Teaching Materials: Inservice packet, cost(unknown)

PROJECT EVALUATED:

Yes _____ No __X__ Internal _____ External Agency _____
In process at this writing.

PROJECT PUBLICITY: Not answered

PROJECT ACTIVITIES SINCE 1974 REPORT: None, new project.

PLANS FOR THE FUTURE: Have submitted for continuation monies from Title IV ESEA, State of Illinois.

WATERSHED HERITAGE PROJECT

Institute for Environmental Education
8911 Euclid Avenue
Cleveland, Ohio 44106
U.S.A.

Telephone: (216) 791-1775

Director: Joseph H. Chadbourne

Project Duration: 1967-1978

Additional information, see also the 20-Year Cumulative Directory for title change.

Age: 12-adult
Ability: all
Subject: Environmental
Language: English
Translations: none
Testing of Students:
- lab performance tests
- teacher judgments
- field performance tests

Materials Developed by Project:

Print
- Textbooks
- Lab Books
- Supplementary Books
- Activity Sheets
- Tchr. Manuals
- Field Guides
- Eval. Materials
- Behavioral Objectives
- Overview of Project
- Newsletters

Non-Print
- Filmstrips
- Audiotape
- Lab Equipment

Types of Learning Experiences:
- Seminar
- Discussion
- Independent Study
- Lab Activities
- Field Experiences
- Audio/Visual

PRINCIPAL PROFESSIONAL STAFF: Thomas W. Offutt, Co-director

When project is set up in a new geographic region, a local university professor and his assigned graduate student coordinator are the principal staff.

PROJECT HISTORY:

Principal Initiator(s): Joseph H. Chadbourne

Reason(s) for Project Initiation: To meet teacher-perceived need for student involvement in practical, applied field investigations on original community environmental problems.

Evolution and Development of the Project: Summer courses for students only; then summer courses with teachers and students mixed; then a 12th grade applied and integrated science course; then a teacher training program at Tilton School, NH; then a National Demonstration Project, the Cuyahoga Heritage Project, in Cleveland; expanded to five-region Ohio Statewide pilot program; now, a national curriculum; still being demonstrated, tested, replicated throughout United States.

PROJECT OBJECTIVES:

Overall Project Purpose: to provide science teachers with a supplementary field program in which students can focus on real community problems. Students then acquire some precareer research skills, some knowledge of how the community functions; and some sense of their own learning abilities, interests, and alternatives.

Specific Objectives: to train teachers to (1) develop a student-involvement program, (2) learn basic water quality skills as an example of how to apply the program, (3) gain some knowledge of overall natural history, social and political structures of community, (4) to commence an environmental service project in which students seek out data or conduct experiments in establishing a watershed management system in conjunction with environmental regulatory agencies.

WATERSHED HERITAGE PROJECT (2)

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: All ability levels in secondary school, college and teacher training have used the Project. It is ideal for a gifted and talented independent study program or as a supplementary program for a natural or social science teacher.

Ways in which it differs from similar or previous programs:

A local university becomes coordinator among several teachers in one school, and several schools in one region. An environmental regulatory agency contracts with the multi-school consortium to receive training from the university and then perform a body of investigative work for the regulatory agency. The data collected is not used for litigation.

Students share the greatest responsibility with the teacher for planning, carrying out, evaluating, and reporting the results. It involves kids with adults, amateurs with professionals. It has, therefore, precareer implications of some considerable impact.

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material	Cost	Source
The Institute for Environmental Education - history, philosophy, Guide overview, and services.	$2.25	IEE[1]
An Environmental Education Guide for Administrators- committee, cadre, program, community, resources.	2.25	IEE
An Environmental Education Guide for Teachers - implementation strategies, ideas, tips, resources.	4.50	IEE
An Environmental Education Guide for Workshops - responsibilities for Host, Site, and Program Managers.	2.25	IEE
Curriculum Activities Guides to:		
Water Pollution Procedures, set only	8.75	IEE
Water Pollution Equipment	6.75	IEE
Solid Waste	6.75	IEE
Birds, Bugs, Dogs, and Weather	6.75	IEE
Case Histories - studies, evaluations, technical reports, 5 to 20 pp.	request titles	IEE
Reprints - articles, features, single-topic publications	request titles	IEE
Non-printed media - films, film loops, tape cassettes.	request titles	IEE
"The Investigator" - a monthly newsletter by teachers and students, supplement Series E.	$10.00/year	IEE
Membership Subscription - One copy of all Curriculum Activity Guides, plus one copy of all publications in 74-75, including monthly newsletter.	$100.00/year	IEE

PRESENT COMMERICAL AFFILIATIONS:

[1] Institute for Environmental Education
8911 Euclid Avenue
Cleveland, Ohio 44106

Date of latest edition: March, 1976

MATERIALS AVAILABLE FREE: Only the Project brochure, price lists, descriptive information flyers on Learning Units.

ADDITIONAL MATERIALS BEING DEVELOPED: Sequels to the first 5 learning units in Phase I, as well as Phase II, and Phase III materials being developed. These include written, audio-visual guides plus hardware.

TEACHER PREPARATION:

Consultant Services: The Institute will meet with administrators and teachers from a cluster of schools to establish a workshop or summer training program. At that time the local University is brought into the group to act on the Institute's behalf, to provide inservice assistance. Materials, equipment, supplies and summer training centers provide teacher-student teams with all startup skills and tools to begin the project the following September. Relationships with local universities are established following a three-phase plan. Phase I - skills, Phase II - general knowlege of watershed region, Phase III - a public service and watershed management program. In Phase III, the University and environmental regulatory agency participate.

Pre-service and In-service Training: Workshops follow the above planning session. These are 1-3 days normally, they are paid by charging a fee to each teacher-student team. Thereafter, summer training programs are set up each summer in different parts of the U. S. Again, these are paid by the participant. Each teacher must bring one student. Summer costs include room and board, instruction, equipment, supplies, instructional materials, and depend upon which Phase enrolled.

Pre-service and In-service Teaching Materials: Volumes I-VI are each $6.75. These include a Teacher's Planning Guide, Volume VI, and hundreds of student activities on a watershed basis.

PROJECT EVALUATED:

Yes X No ____ Internal ____ External Agency ____

Name of Outside Evaluators: Ford Foundation

Pertinent Research Studies: A Case History of the Watershed Heritage Project - just published reports the activities in five Ohio regions, teacher, student, graduate student, parent, and observer evaluations of the project.

In-House or Unpublished Research: Students are overwhelmingly enthusiastic about working equally with the teacher, sharing with other students (rather than competing), being valued for their contribution to a team research project, and "doing something about the environment". Teachers find heightened student interest in them, school work, other courses, assumption of responsibilities previously thought unlikely. Parents are very supportive, providing assistance frequently. School Boards and principals want expanded activities, additional materials and to incorporate the program.

Availability of Evaluative Data: The Case History is the most complete record of assessment. It is available from the Institute at cost.

PROJECT PUBLICITY:

Hall, Cherri, Watershed Heritage Project, Horizons '76 Ideabook, American Revolution Bicentennial Administration, U.S. Government Printing Office: 1976, 0-52-008-00012-3, 0.85

Offutt, Thomas W. "Students in a Water-Testing Program", The Science Teacher, Vol 42, No. 2, Feb. 1975.

Offutt, Thomas W. "Community Problems An Educational Opportunity?, Environmental Education: Strategies Toward a More Livable Future, James Swan and William Stapp, eds., Sage Publications, distributed by Halsted Press, Div. of John Wiley & Sons, Inc., New York.

Chadbourne, Joseph H. The National Association for Independent Schools Bulletin, Spring 1974, NAIS, Boston, Massachusetts.

WATERSHED HERITAGE PROJECT (4)

PROJECT PUBLICITY: (continued)

Wood, Walter "Ecological Drums along the Cuyahoga", American Education, January-February 1973, Office of Education (HEW), Washington, D. C.

Corrado, Frank "This is All About Environmental Education (You're Going to Have to Learn It by Yourself)" Environment Midwest, February 1975, Region V, U.S. Environment Protection Agency, Chicago, Illinois.

"Environmental Protection through Education", Science News, Vol. 105, March 2, 1974.

PROJECT ACTIVITIES SINCE 1974 REPORT:

Project expanded twice - once from a Cleveland area program to a five-region Ohio Project, now to a national program. It has been recognized by American Revolution Bicentennial Administration, Department of Housing and Urban Development, approved until 1978 by U.S. EPA, and has been a National Demonstration Project of the Office of Environmental Education for three years.

PLANS FOR THE FUTURE:

Project will be developed through the three Phases (Phase I now completed) through June 1978. Each summer, training sessions will be held (write for information on where and when) for consecutive Phases.

WHAT PEOPLE EAT - WHY PEOPLE EAT

City College Center for
Biomedical Education
136 Street at Convent Avenue
New York, New York 10031
U.S.A.

Telephone: (212) 690-6861

Director: Isaias Raw

Project Duration: 1971-

Additional information, see also the 20-Year Cumulative Directory for title change.

Age: 18+
Ability: all
Subject: biol, chem, nutrition health sci
Language: English
Translations: none
Testing of Students: written achievement tests, teacher judgments

Materials Developed by Project:

Print	Non-Print
Textbooks	Lab Equipment
Lab Books	Computer Program for diet analysis

Types of Learning Experiences:
Seminar
Discussion
Independent Study
Lab Activities

PRINCIPAL PROFESSIONAL STAFF:

Isaias Raw, Professor
E. R. Pariser, Senior Scientist
J. Vournakis, Assistant Professor
S. Schwartz

PROJECT HISTORY:

Principal Initiator(s): E. Pariser
J. Vourkanis
I. Raw

Reason(s) for Project Initiation: Provide a new science course that would attract average non science motivated students.

Evolution and Development of the Project: The project evolved from experiments to find a science course, that aroused and maintained the motivation of average students from Community Colleges in the Cambridge area, in addition to those taking courses at the Education Res. Center of MIT. It was then implemented in the Detroit Institute of Technology, and after two summer workshops, in several other Colleges.

PROJECT OBJECTIVES:

Overall Project Purpose: The main purpose of this project is to design a science course, without pre-requisites, that would motivate the average student with no interest for chemistry and other sciences.

Specific Objectives: Create an individualized course, where the students' own diet is investigated. Provide an open-ended laboratory that can be extended by student-initiated projects. Provide a self-paced text-lab guide, that offers for the students the possibility to understand chemistry, without being discouraged by artificial problems and by an apparently unrelevant science. Attempt to create a rational attitude that may lead to dietary changes.

UNIQUE CHARACTERISTICS OF THE PROJECT:

Target Population: Average college student, with poor or no background and motivation towards sciences, especially chemistry. May be used in grades 11-12 or in introductory level or community college programs.

Ways in which it differs from similar or previous programs: Student's own diet is the material for investigation.
Self paced, individualized activities.
Text is an inquiry into the nature of food, and has unanswered questions, and quizzes, that allows continuous evaluation of each student's progress.

WHAT PEOPLE EAT - WHY PEOPLE EAT (2)

MATERIALS ALREADY PRODUCED, INCLUDING SOURCES AND COSTS:

Material

What People Eat - combined lab and text and teacher's guide

PRESENT COMMERCIAL AFFILIATIONS:

W. Kaufman Publishers, One First Street, Palo Alto, California 94022
Eduquip Machalaster, 1085 Commonwealth Avenue, Boston, Mass. 02215

MATERIALS AVAILABLE FREE: Examination copies of What People Eat

ADDITIONAL MATERIALS BEING DEVELOPED:

Why People Eat - text and lab guide
What People Eat - lab guide, advanced edition

TEACHER PREPARATION:

Consultant Services: None, but special training observation of teaching may be arranged at Detroit or New York.

PROJECT EVALUATED:

Yes X   No ____   Internal X   External Agency ____

PROJECT PUBLICITY:

J. Col. Science Teaching 4:177 (1975)
Chem. News July 8, 1974, pg 29

PROJECT ACTIVITIES SINCE 1974 REPORT:

Preparation of plans for volume II, began revision of volume II

PLANS FOR THE FUTURE:

Publication of preliminary version of volume II, revision and publication of the final edition, and of a separated lab guide.

VII. TWENTY-YEAR CUMULATIVE DIRECTORY TO PROJECTS
appearing in
THE INTERNATIONAL CLEARINGHOUSE REPORTS 1956-1976

Projects are listed alphabetically by country of origin. Countries are arranged on the basis of strictly geographical considerations into continental areas, as identified in major atlases.

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
AFRICAN AREA					
Botswana					
SCIENCE BY INVESTIGATION IN BOTSWANA	G. Makunga	12-15	integ-s	English	10
Congo					
NATIONAL EDUCATION INSTITUTE SCIENCE EDUCATION PROGRAM	P. Viard		b		4
Ethiopia					
NEW SCIENCE CURRICULUM	A. A. Karrar	6-18	b,c,p, e-s	Amharic, English	10
Ghana					
ELEMENTARY SCIENCE SCHEME	S. Adu-Ampoma	6-12	s	English	7
GHANA ASSOCIATION OF SCIENCE TEACHER'S PROJECT FOR SCIENCE INTEGRATION (GAST:PSI)	S. Adu-Ampoma	6-12 TEd	n-s,h, g-s	English	8
JOINT SCHOOLS PROJECT (J.S.P.)	M. Mitchelmore	11-16	m	English	9,7,6
NEW MATHEMATICS FOR PRIMARY SCHOOLS (See: African Regional Project: African Mathematics Program)		6-14	m	English	8
PROJECT FOR SCIENCE INTEGRATION (PSI)		12-14	integ-s	English	10
SIXTH FORM MATHEMATICS PROJECT GROUP (SFMPG)	E.M. Hartley	16-20	m	English	7
Kenya					
KENYA PRIMARY MATHEMATICS	G.M. Kimote	6-12	m	English	10
KENYA PRIMARY SCIENCE (KPS)	M.B.R. Savage F. K'Opiyo	6-12	s	English	10
KENYA SCIENCE TEACHERS COLLEGE	A.W. Mbogho B.O. Marinder	TEd	b,c,p	English	9,7
MATHEMATICS AND SCIENCE			b,c,p,m, s-s	English	9

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Lesotho					
LESOTHO INTRODUCTORY SCIENCE IMPROVEMENT PROGRAM (LISIP)	P.J. Towse S. Baholo	14-19	s	English	9
LESOTHO SCIENCE CURRICULUM DEVELOPMENT PROGRAMME (L.S.C.D.P.)	E.S. Mohapi	11-14	b,c,p, integ	English	8
Morocco					
MATERIAL AND DOCUMENTATION CENTER	M. Bareik	12-18	n-s	French	8
Nigeria					
AIYETORO BASIC SCIENCE PROGRAMME	M.K. Skapski	11-13	g-s	English	7
THE HARVARD/NIGERIAN PROJECT COMPREHENSIVE HIGH SCHOOL AIYETORO	R. Hinkle	12-19	all	English	6
MIDWESTERN STATE OF NIGERIA PRIMARY SCIENCE PROJECT (Assisted by UNESCO/UNICEF)	F.O. Agun	6-12 TEd	b,c,p, e-s	English	9
NIGERIAN INTEGRATED SCIENCE PROJECT (NISP)	A. Osiyale	10-14	b,c,p, integ	English	8
NIGERIAN NATIONAL EDUCATION RESEARCH COUNCIL PROJECTS	J.M. Akintola		c,b,p,m, e-s,s-s t	English	9
NORTHERN NIGERIA TEACHER EDUCATION PROJECT	R. Owen	TEd		English	6
PRIMARY EDUCATION PROJECT PRIMARY SCIENCE PROGRAMME (See: UNESCO/UNICEF Primary Science Program)	B.L. Young	6-12	s	English	9
PROGRAMMED LEARNING IN SCIENCE AND MATHEMATICS IN A DEVELOPING COUNTRY	T.A. Balogun	12-17+	b,m	English	7
S.T.A.N. CURRICULUM DEVELOPMENT PROJECT	G. Howell	12-14	b,c,p integ	English	7
UNESCO/UNICEF, INSTITUTE OF EDUCATION CURRICULUM DEVELOPMENT PROJECT FOR SIX NORTHERN STATES IN NIGERIA	P.D. Merrick	6-12	integ s		8
UNESCO/UNICEF PRIMARY SCIENCE PROGRAM (See: Primary Education Project Primary Science Programme)	P.D. Merrick	6-12	s	Hausa English	8

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Nigeria (continued)					
UNIVERSAL PRIMARY EDUCATION TEACHER EDUCATION MATERIAL PRODUCTION PROJECT	H.S. Wali	TEd	g-s	English, Hausa, Yoruba, Igbo, Edo, Efik, Kanuri, Fulfulde	10
Republic of South Africa					
SOUTH AFRICAN MATHEMATICS PROJECT (SAMP)	J. Holtzhausen	6-18	m	English	8
Sierra Leone					
CORE COURSE INTEGRATED SCIENCE (CCIS)	B. Nicholl D. R. Hill	13-15	b,c,p, e-s,s-s	English	10,9
Swaziland					
SWAZILAND INTEGRATED SCIENCE PROJECT (SWISP)	D. Slimming	11-20	b,c,p	English	9
Tanzania					
NEW MATHEMATICS FOR TANZANIA	J.E. Phythian	6-18	m	English, Swahili	8
Regional African Projects					
AFRICAN MATHEMATICS PROGRAM (AMP) (See: East African Regional Mathematics Programme and: West African Regional Mathematics Programme)	J. Joanou H.P. Bradley W.T. Martin	6-18 TEd	m	English, Swahili, Kpelle	8,7,6, 5,4
AFRICAN PRIMARY SCIENCE PROGRAM	R. Robins R. Carlisle	6-13	pr-s	Swahili	9,8,7, 6,5
EAST AFRICAN REGIONAL MATHEMATICS PROGRAMME (EARMP) (See: African Mathematics Program)	J. Joanou	TEd	m	English	9,8
EAST AFRICAN SECONDARY SCIENCE PROJECT (EASSP)		15-18	b,c,p	Swahili, English	9,8
EVALUATION OF SCIENCE EDUCATION PROGRAMME FOR AFRICA PRIMARY SCIENCE MATERIALS	E.A. Yoloye	6-12 TEd	pr-s	English	9

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Regional African Projects (Continued)					
SCHOOL MATHEMATICS PROJECT OF EAST AFRICA (SMPEA)	T.D. Morris	12-21	m	English	6,5
SCIENCE EDUCATION PROGRAMME FOR AFRICA (SEPA)	J.M. Dyasi	6-12	b,c,p,t	English	10,9,8
UNESCO PILOT PROJECT ON NEW APPROACHES AND TECHNIQUES OF BIOLOGY TEACHING IN AFRICA	R. Buchsbaum A. Hunwald	11-18	b	English French	7,6,5
WEST AFRICAN A-LEVEL BIOLOGY	J.B. Hall D.W. Ewer	16-18	b	English	10,7
WEST AFRICAN EXAMINATIONS COUNCIL A-LEVEL CHEMISTRY SYLLABUS PROGRAM	R.E. Pearson J.B. Redhead	16-18	c	English	7,6,4,5
WEST AFRICAN REGIONAL MATHEMATICS PROGRAMME (WARMP) (See: African Mathematics Program)	D.A. Brown J. Joanou	6-17	m	English	9,8
ASIAN AREA					
Afghanistan					
CURRICULUM AND TEXTBOOK PROJECT (C/T PROJECT)	R. Whittemore A.A. Hamid	7-12	m	Dari, Pashto	9,8
TCCU AFGHANISTAN CURRICULUM PROJECT		6-12			6
Bahrain					
AUDIO VISUAL AIDS FOR SCIENCE TEACHING	M.W. Huort	11-13	g-s	Arabic	8
Bangladesh					
BANGLADESH EDUCATIONAL EQUIPMENT DEVELOPMENT BUREAU (Formerly: East Pakistan Educational Equipment Development Bureau)	Md.B. Haque W. Ahmed	5-18	s	Bangali, English	9,6,5 4
Hong Kong					
HONG KONG BSCS ADAPTATIONS	J. Chan	13-17 TEd	b	English Chinese	9,7
SIMPLIFIED APPARATUS PROJECT (SAP)	R.F. Simpson	12-18	c,p, g-s	English	8

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
India					
ALL INDIA SCIENCE TEACHERS ASSOCIATION PHYSICS STUDY GROUP (AISTA PHYSICS STUDY GROUP)	B.G. Pitre	11-13 TEd	b,c,p	English, Hindi, Marathi	9,8,7
BOMBAY SCIENCE AND MATHEMATICS IMPROVEMENT PROJECT	M. R. Shah	5-12	b,c,p,m, e-s	Hindi, Urdu, Marathi, Gujarati	9
COMMUNITY SCIENCE CENTRE (See: Vikram A. Sarabhai Community Science Centre)	K. B. Shah	9-20	b,c,p,m, e-s,t	English, Gujarati	7
CREATIVE PHYSICS TEACHING PROJECT AT THE UNIVERSITY LEVEL (CPTP)	R. Ahmed	16-18	p	English	9
DEVELOPMENT OF CURRICULUM IN SCIENCE AND MATHEMATICS (National Council of Educational Research and Training)	D. Kothari M. C. Pant	5-16+	b,c,p,m	English, all 12 Indian languages	7
EXPERIMENTAL PROJECT ON TEACHING OF SCIENCE AND MATHEMATICS AT THE MIDDLE SCHOOL STAGE	A. N. Bose M. C. Pant	11-13 TEd	b,c,p	Hindi, 11 Regional languages	9,8,7 6,5
HIGH SCHOOL MATHEMATICS	K. B. Shah	13-16	m	Gujarati	9
INTEGRATED SCIENCE	C. Sanchorawala	13-15	integ	English, Gujarati	9
NATIONAL SCIENCE TALENT SEARCH SCHEME	R. Ahmed K. N. Saxena	16	b,c,p,m	English, all Regional languages	9,5
PHYSICS RESOURCE MATERIAL FOR SECONDARY SCHOOL TEACHERS (P.R.M.)	V. R. Rao	TEd	p	English	9
PHYSICS STUDY GROUP	S. Chatterjee	10-14+	p	English, Bengali	7
PRIMARY SCHOOL SCIENCE PROJECT	V.N. Wanchoo	6-11	g-s	English, Hindi	7
SCIENCE LEARNING THROUGH INQUIRY	L. S. Rao	11-13	b,c,p	English, Gujarati	9
SCIENCE TEACHERS' WORKSHOP (STW)	C. S. Rao	TEd	s	English	7
UNESCO SECONDARY SCIENCE TEACHING PROJECT	S.A. Balezin	5-18	s		6

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
India (Continued)					
UNICEF ASSISTED PROJECT FOR THE IMPROVEMENT OF SCIENCE TEACHING AT ALL LEVELS OF SCHOOL EDUCATION (UNICEF PROJECT)	A. N. Bose M. C. Pant	6-11	b,c,p, g-s	English, Hindi, 11 Regional languages	9,8
VIKRAM A. SARABHAI COMMUNITY SCIENCE CENTRE (VASCS) (See: Community Science Centre)	K. B. Shah	9-17	b,c,p,m, e-s,ed-t	English, Gujarati, Hindi	10,9,8
Indonesia					
DEVELOPMENT SCHOOL PROJECT PROYEK PERINTIS SEKOLAH PEMBANGUNAN (PPSP)	M. Soedijarto	6-17 TEd	b,c,p, m,e-s, s-s	Indonesian, English	10
Iraq					
MODEL PRIMARY SCHOOL SCIENCE PROGRAM	J.A. Hasson	6-12	s		5
Israel					
ADAPTATION OF THE BSCS YELLOW VERSION FOR USE IN HIGH SCHOOLS IN ISRAEL (See: Israel BSCS Adaptation Project)	A. Poljakoff-Mayber E. Jungwirth	13-18	b	Hebrew	6,5
AGRICULTURE AS ENVIRONMENTAL SCIENCE PROJECT (AES)	A. Blum	11-16	b,s-s, agr —e, e-e,en-s	Hebrew, Arabic, English	10,9,8,7
AGROBIOLOGY	E. Jungwirth	14-15	b,agr-e	Hebrew	6
BIOLOGY FOR THE JUNIOR HIGH SCHOOLS	M. Silberstein	12-13	b	Hebrew	8,7
BSCS ADAPTATION PROJECT IN ISRAEL (See: Israel BSCS Adaptation Project)	P. Tamir A. Poljakoff-Mayber	13-18	b	Hebrew	8,7
CHAPTERS IN BIOLOGY AND AGRICULTURE (See also: Israel BSCS Adaptation Project)	A. Polyakov	14-17	b	Hebrew	9,8
CHEMISTRY IN MODERN SOCIETY (See: A Socially Oriented Approach Through Carbon Compound Chemistry for Non-Science Majors at The Secondary Level)	S. Novic	14-16	c	Hebrew	9

Israel (Continued)

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
EXPERIMENTAL CHEMISTRY PROGRAMME FOR SECONDARY SCHOOLS (REHOVOT CHEMISTRY GROUP) (ECPSS)	D. Samuel	13-17 TEd	c	Hebrew	9,8,7, 6,5
EXPERIMENTAL PHYSICS PROGRAMME FOR SECONDARY SCHOOLS (REHOVOT PHYSICS GROUP)	H. Harari A. de-Shalit	15-18	p	Hebrew	10,9,8,6
HEBREW UNIVERSITY PROJECT FOR SECONDARY SCHOOL MATHEMATICS	S.A. Amitsur	15-18	m	Hebrew	9
ISRAEL BSCS ADAPTATION PROJECT (IBAP) (See: Israel High School Biology Project and: Adaptation of the Yellow Version for Use in High Schools in Israel and: BSCS Adaptation Project in Israel)	P. Tamir	13-18	b	Hebrew	9
ISRAEL ELEMENTARY SCIENCE PROJECT (MATAL) (See: The Study of New Approaches to the Teaching of Elementary Science in Elementary Schools)	D. Chen	5-11	b,c,p, e-s	Hebrew	10,9,8
ISRAEL HIGH SCHOOL BIOLOGY PROJECT (IHBP) (See: Israel BSCS Adaptation Project)	P. Tamir	14-17	b	Hebrew	10
ISRAEL SCIENCE TEACHER EDUCATION PROJECT (ISTEP) (HEMED)	P. Tamir	TEd	b,c,p, e-s	Hebrew	10
MATHEMATICS FOR JUNIOR HIGH SCHOOLS	J. Gillis	12-14	m	Arabic, Hebrew	9,8
MODERN MATHEMATICS FOR SCHOOLS	M. Maschler	12-14	m	Hebrew	7
NETA: SECTION FOR 7TH GRADE BIOLOGY FOR HETEROGENOUS CLASSES CONTAINING CULTURALLY DEPRIVED STUDENTS (PROJECT NETA)	M. Smilansky	12	b	Hebrew	9,8,7
PHYSICS-CHEMISTRY PROJECT (IN ISRAEL)	N. Orpaz R. Ben-Zvi	12-17	c,p	Hebrew	10,8,7

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Israel (Continued)					
A SOCIALLY ORIENTED APPROACH THROUGH CARBON COMPOUND CHEMISTRY FOR THE NON-SCIENCE MAJORS AT THE SECONDARY LEVEL (See: Chemistry in Modern Society)	S. Novick	14-16	c	Hebrew	8
THE STUDY OF NEW APPROACHES TO THE TEACHING OF ELEMENTARY SCIENCE IN ELEMENTARY SCHOOLS (See: Tel-Aviv University Elementary Science Project) and Israel Elementary Science Project (MATAL))	M. Feuchtwanger	5-13	s	Hebrew	6,5
TEL-AVIV UNIVERSITY ELEMENTARY SCIENCE PROJECT (TAESP) (See: The Study of New Approaches to the Teaching of Elementary Science in Elementary Schools)	M. Feuchtwanger	5-13	s	Hebrew	7,4
THE TEACHING OF MATHEMATICS IN HIGH SCHOOLS	S.A. Amitsur	14-17	m	Hebrew	6,5
Japan					
ASTRONOMY AND EARTH SCIENCE CURRICULUM DEVELOPMENT FOR SENIOR SECONDARY SCHOOL (AESCD)	J. Inamori	15-17	e-s	Japanese	9
ADAPTATION OF BSCS HIGH SCHOOL MATERIALS INTO JAPANESE (See: Basic Biology Education Study)	Y. Sinoto	15	b	Japanese	6,5,4
BASIC BIOLOGY EDUCATION STUDY (See: Adaptations of BSCS High School Materials into Japanese)	Y. Sinoto	13-18	b	Japanese	7
BIOLOGY CURRICULUM DEVELOPMENT AND EVALUATION (BCDE)	H. Morikawa	15-17	b	Japanese	10
COLLEGE INTRODUCTORY CHEMISTRY COURSE ON THE CONCEPTS OF ENERGY AND STRUCTURE (CES) (See: General Chemistry Course Plan Based on Concepts of Energy and Structure)	B. Tamamushi	18+	c	Japanese	9

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Japan (Continued)					
THE CONFERENCE OF SCIENCE EDUCATION STUDY IN OSAKA, JAPAN (CSES)	T. Isemura K. Imahori	6-14	b,c,p, e-s	Japanese	9,6,5,4
DESKARTES (See: Development of Computer-Assisted Instruction in Science Education)	S. Kobayashi	12-14	n-s	Japanese	8
DEVELOPMENT OF COMPUTER-ASSISTED INSTRUCTION IN SCIENCE EDUCATION (See: Deskartes)	S. Kobayashi	12-14	n-s	Japanese	7
DEVELOPMENT OF TEACHING EQUIPMENT FOR SCIENCE EDUCATION	R. Okazaki	6-adult	s	Japanese	7
EDUCATIONAL MATERIALS AND INSTRUMENTATION (See: Visual Aids In Science Education)	K. Higasi	15-17	b,c,p, e-s	Japanese	8
ELEMENTARY SCIENCE IMPROVEMENT COMMITTEE	H. Morikawa	6-14	s	Japanese	7
ENGINEERING CURRICULUM IMPROVEMENT (See: Tokyo University Study Group on Engineering Science)	T. Mukaibo	18+	en-s	Japanese	4
GENERAL CHEMISTRY COURSE PLAN BASED ON CONCEPTS OF ENERGY AND STRUCTURE (See: College Introductory Chemistry Course on the Concepts of Energy and Structure)	B. Tamamushi	18+	c	Japanese	6,5,4
IMPROVEMENT OF ELEMENTARY AND JUNIOR HIGH SCHOOL SCIENCE CURRICULA	T. Shirai	6-14	s	Japanese	7
IMPROVEMENT OF HIGH SCHOOL BIOLOGY CURRICULUM (IBC)	H. Kinosita	15	b	Japanese	8
INTEGRATED SCIENCE CURRICULUM PROJECT	Y. Kakiuchi	12-14	s,e-e	Japanese	9,8
INTERNATIONAL SILKWORM TEACHING SOCIETY (ISTS)	M. Nagoya	4-adult	b,c,p	Japanese, English	9
LABORATORY INSTRUCTION AND TEACHING AIDS IN COLLEGE INTRODUCTORY CHEMISTRY (LCC)	U. Yoshino B. Tamamushi	18-19	c	Japanese	9,7

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Japan (Continued)					
LEARNING PROCESS APPROACH IN SCHOOL SCIENCE	Y. Kakiuchi	12-14	b,c,p, e-s	Japanese	8
MODERNIZATION OF MATHEMATICS IN ELEMENTARY AND SECONDARY SCHOOLS	Y. Akizuki	6-18	m	Japanese	7
MODERNIZATION OF SECONDARY SCHOOL CHEMISTRY (MSSC)	M. Oki	15-17	c	Japanese	9,7
MODULAR APPROACH IN THE TEACHING OF BIOLOGY (MATB)	H. Kinoshita	16-18	b	Japanese	9
NEW EXPERIMENTS FOR FRESHMAN CHEMISTRY	B. Tamamushi	18+	c	Japanese	7
PHYSICS FOR PRE-MEDICAL STUDENTS	H. Kanazawa	14+	p	Japanese	7,6
RESEARCH AND TRIAL PRODUCTION OF MATERIALS AND EQUIPMENT FOR TEACHING HIGH SCHOOL PHYSICS	A. Harashima	14-18	p	Japanese	7
SCIENCE AND MATHEMATICS INSTRUCTION IN A SCIENCE AND MATHEMATICS ORIENTED HIGH SCHOOL	K. Shiomi	5-18	b,c,p, g	Japanese	7
SCIENTIST'S APPROACH TO PHYSICS EDUCATION	Y. Kakiuchi	14+	p	Japanese	6
THE SOCIETY OF UNIVERSITY EDUCATION IN THE BIOLOGICAL SCIENCES (SUEBS)	Y. Nakajima	19	b	Japanese	9,8
SPECIAL STUDY OF SCIENCE EDUCATION	H. Ootsuka	8-18	g-s	Japanese	7
STUDIES ON THE INTEGRATED SCIENCE CURRICULUM	H. Ohashi	12-17	e-s,s-s, b,c,p	Japanese	10
THE STUDY TO MODERNIZE THE PHYSICS CURRICULUM OF UPPER SECONDARY SCHOOLS (KBGK PROJECT)	K. Ishiguro	16-17	p	Japanese	10,9
TEACHING OF PHYSICS THROUGH EXPERIMENTS	I. Ikeda	15-18	p	Japanese	7
TEACHING STRATEGIES FOR BASIC CONCEPTS OF GEOLOGY	K. Watanabe	6-18	geol	Japanese	7

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Japan (Continued)					
TOKYO UNIVERSITY STUDY GROUP ON ENGINEERING SCIENCE (See: Engineering Curriculum Improvement and: University of Tokyo Engineering Education Curriculum)	T. Mukaibo	18+	en-s	Japanese	6
UNIVERSITY OF TOKYO ENGINEERING EDUCATION CURRICULUM (See: Tokyo University Study Group on Engineering Science)	T. Mukaibo	18+	en-s	Japanese	5
VISUAL AIDS IN SCIENCE EDUCATION (VISUAL) (See: Educational Materials and Instrumentation)	K. Higasi	15-17	b,c,p, e-s	Japanese	9
Korea					
ELEMENTARY SCIENCE TEXTBOOK EDITING PROJECT	C. Y. Bok	6-12	s	Korean	6,5,4
KOREAN SCIENCE EDUCATION PROJECT (See: Science Education Project, Ministry of Education, Seoul)	B. K. Ha	6-18	b,c,p, m,e-s	Korean	9
NEW SCIENCE CURRICULUM STUDY PROJECT	C. Y. Tai	6-18	b,c,p,s, e-s,p-s	Korean	6,5,4
SCIENCE EDUCATION PROJECT, MINISTRY OF EDUCATION, SEOUL (See: Korean Science Education Project)	B. K. Ha S. J. Pak	6-18	b,c,p, g-s,n-s, e-s	Korean	8,7
Lebanon					
EDUCATIONAL TELEVISION (ETV)	W. Haddad K. Fakhoury	5-adult TEd	b,c,p,m, e-s,s-s, ed-t	Arabic, English, French	10
INTERMEDIATE SCHOOL SCIENCE PROJECT (ISSP) (See: Lebanese Science Book Project (Intermediate)	W. Haddad	11-14 TEd	b,c,p, e-s	English, French, Arabic	10
LEBANESE SCIENCE BOOK PROJECT (ELEMENTARY) (See: Primary School Science Project)	G.I. Za'rour W. Haddad	6-10	g-s	Arabic	9

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Lebanon (Continued)					
LEBANESE SCIENCE BOOK PROJECT (INTERMEDIATE) (See: Intermediate School Science Project)	G.I. Za'rour	7-10	b,c,p, e-s	English, French	9
PRIMARY SCHOOL MATHEMATICS PROJECT (PSMP)	W. Haddad R. Eido	6-10 TEd	m	Arabic	10
PRIMARY SCHOOL SCIENCE PROJECT (PSSP) (See: Lebanese Science Book Project (Elementary)	W. Haddad	6-10 TEd	b,c,p, e-s	Arabic	10
Malaysia					
INTEGRATED SCIENCE FOR MALAYSIAN LOWER SECONDARY SCHOOLS	C. Kwai	11-14 TEd	s	English, Malay	9
MALAYSIAN BIOLOGY, CHEMISTRY, PHYSICS PROJECT	A. A. Smah	18+	b,c,p	English, Malay	9
MALAYSIAN GENERAL SCIENCE PROJECT (MGSP) (See: Modern General Science)	Y. Suan	TEd	b,c,p	English, Malay	10
MODERN GENERAL SCIENCE (See: Malaysian General Science Project)		15-17	b,c,p	English, Malay	9
PROJECT KHAS	A. Hassan	5-11	s,m	Malay	8
SEAMEC-REGIONAL CENTER FOR EDUCATION IN SCIENCE AND MATHEMATICS-RECSAM (See: Southeast Asia Science and Mathematics Experiment)	C. P. Seng	6-18 TEd	s,m	English	9,7
SOUTHEAST ASIA SCIENCE AND MATHEMATICS EXPERIMENT (SEASAME) (See: SEAMEC-Regional Center for Education in Science and Mathematics)	C. P. Seng	6-18 TEd	s,m	English	9
SPECIAL PROJECT MATHEMATICS AND SCIENCE	M. Ibrahim	6-14	s	English, Malay	7
Nepal					
SCIENCE TEACHING ENRICHMENT PROGRAMME (STEP)	P. Cross	10-16	h,g-s, phys	English, Nepali	8,7,6

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Pakistan					
MODERNIZATION OF MATHEMATICS AND SCIENCE SYLLABI IN PAKISTAN	T. Hussain	12-20	c,p,s,m	English, Urdi	8
SCIENCE EDUCATION PROJECT (S.E.P.) INSTITUTE OF EDUCATION AND RESEARCH	A. H. Syed	14-16+	n-s,p-s, b,c,p	English, Urdi	8
WEST PAKISTAN EDUCATIONAL EQUIPMENT TECHNICAL ASSISTANCE CENTER	S. N. Ahmed	5-18	s	Bengali	6,5
Philippines					
BEE ELEMENTARY MATHEMATICS CURRICULUM DEVELOPMENT PROJECT (See: Bureau of Public Schools Elementary Mathematics Improvement Program)	L.B. Soriano	6-11	m	English	New Title (1976)
BEE ELEMENTARY SCIENCE CURRICULUM DEVELOPMENT PROJECT (See: Elementary Science Curriculum Development)	L.B. Soriano	6-11	integ.	English	New Title (1976)
BUREAU OF PUBLIC SCHOOLS ELEMENTARY MATHEMATICS IMPROVEMENT PROGRAM (See: BEE Elementary Mathematics Curriculum Development Project)	L.B. Soriano	7-12 TEd	m	English	9
BUREAU OF PUBLIC SCHOOLS PEACE CORPS/PHILIPPINES ELEMENTARY SCIENCE AND MATHEMATICS CURRICULUM DEVELOPMENT PROJECT (See: Elementary Science Curriculum Development)	A. Juele	6-11	m,s	English	5,4
ELEMENTARY SCIENCE CURRICUULUM DEVELOPMENT (ESCD) (See: Bureau of Public Schools Peace Corps Philippines Elementary Science and Mathematics Curriculum Development Project and: BEE Elementary Science Curriculum Development Project)	A. Juele	9-12	s	English	6
NSDB-BPS-PCV-U.P. SECONDARY SCHOOL SCIENCE & MATHEMATICS TEACHING IMPROVEMENT PROJECT (PROJECT 2 84)	L.B. Soriano	14-18	g-s,m	English	5,4

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Philippines (Continued)					
NOTRE DAME EDUCATIONAL ASSOCIATION SCIENCE AND MATHEMATICS PROGRAM (NDEA SCIENCE AND MATHEMATICS TEACHING AND TESTING)	F. C. Aquino	12-15	g-s,m, b,c,p	English	6,5
PHILIPPINE SCIENCE EDUCATION (See: Science Education Project of the Philippines)	M. Gonzales	TEd	b,c,p,m	English	8
PHYSICS EQUIPMENT PROJECT	L.B. Soriano	16-17	p	English	8,7,6
REGIONAL SCIENCE TEACHING CENTERS		TEd	s,m	English	7
SCIENCE EDUCATION CENTER UNIVERSITY OF PHILIPPINES (SEC) (See: University of Philippines Science Education Center)	D.F. Hernandez	6-16 TEd	b,c,p, e-s	English	9,8,7, 6,5, 4
SCIENCE EDUCATION PROJECT OF THE PHILIPPINES (See: Philippine Science Education)	G. Rimas	TEd	b,c,p,m	English	9
UNIVERSITY OF THE PHILIPPINES SCIENCE EDUCATION CENTER (See: Science Education Center University of Philippines)	D.F. Hernandez	6-15	b,c,p,m, agr-e, e-s	English	
Republic of China (Taiwan)					
ADAPTATION OF THE BSCS YELLOW VERSION HIGH SCHOOL BIOLOGY INTO CHINESE LANGUAGE (CHINESE BSCS)	T. P. Koh	15	b	Chinese	6
CHINESE JUNIOR SECONDARY SCIENCE PROJECT (CJSSP)	C. Y. Cheng	12-14	b,c,p, e-s	Chinese	10
ELEMENTARY SCHOOL MATHEMATICS CURRICULUM DEVELOPMENT PROJECT OF REPUBLIC OF CHINA (ESMCD)	M. Huang	6-11	m	Chinese	10
THE ELEMENTARY SCIENCE CURRICULUM DEVELOPMENT PROJECT (ESCD)	C. Y. Cheng	6-11	b,c,p, e-s	Chinese	10,9
IMPROVEMENT OF EVALUATION IN SCIENCE TEACHING (IEIST)	K. Yang	12-14	b,c,p,m	Chinese	10
SCIENCE EDUCATION FOR ELEMENTARY SCHOOLS AND HIGH SCHOOLS, K-12	T. P. Koh	5-18	s	Chinese	6

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Singapore					
LOWER SECONDARY SCIENCE CURRICULUM DEVELOPMENT PROJECT (LSS)	C. Cheah	7-14	e-e	English	10,9
THE PRIMARY PILOT PROJECT (PPP)	Y. L. Cheng	6-12	c,p	English	10
Sri Lanka					
BIOLOGY CURRICULUM DEVELOPMENT PROJECT	B. J. Alles	14-15	b	English, Sinhalese, Tamil	6,5
CAAS SCHOOL BIOLOGY PROJECT	V. Basnayake	14-16	b	English, Sinhalese, Tamil	9,6,5,4
CHEMISTRY, CURRICULUM DEVELOPMENT PROJECT	B. J. Alles	14-15+	c	English, Sinhalese, Tamil	6,5
ELEMENTARY MATHEMATICS PROJECT OF SRI LANKA (SLEMP) (See: Science/Math Curriculum Development Project)	D. A. Perera	11-14	m	Sinhalese, Tamil	9
EVALUATION RESEARCH PROJECT	B. J. Alles	14-15+	b,c,p	English, Sinhalese, Tamil	6,5
GENERAL SCIENCE CURRICULUM DEVELOPMENT PROJECT	B. J. Alles	11-13+	e-s,g-s, b,c,p, astr	Sinhalese, Tamil	6,5
JUNIOR SECONDARY SCHOOL MATHEMATICS PROJECT (See: Science/Math Curriculum Development Project)	D. A. Perera	11-14	m	Sinhalese, Tamil	9
JUNIOR SECONDARY SCHOOL SCIENCE PROJECT (See: Science/Math Curriculum Development Project)	A. Ranaweera	11-14	s	Sinhalese, Tamil	9
MATHEMATICS CURRICULUM DEVELOPMENT PROJECT	B. J. Alles	11-15	m	English, Sinhalese, Tamil	6,5,4
PHYSICS, CURRICULUM DEVELOPMENT PROJECT	B. J. Alles	14-15+	p	English, Sinhalese, Tamil	6,5

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Sri Lanka (Continued)					
SCIENCE/MATHEMATICS CURRICULUM DEVELOPMENT PROJECT (See: Elementary Mathematics Project of Sri Lanka and: Junior Secondary School Mathematics Project and: Junior Secondary School Science Project)	B. J. Alles	6-17	m,s	English, Sinhalese, Tamil	7
Thailand					
CEDO LABORATORY/WORKSHOP, COLLEGE OF EDUCATION, THAILAND	D. Leonard	TEd	s	Thai	9
IMPROVEMENT OF TEACHER TRAINING CUM EDUCATION EXTENSION PROJECT COORDINATOR	A. Sunhachawee	6-13 adult TEd	m,s	English	7
THE INSTITUTE FOR THE PROMOTION OF TEACHING SCIENCE AND TECHNOLOGY	S. Sumitra	6-17	b,c,p,m, g-s,p-s	Thai	10,9,8
Asian Regional Projects					
INTEGRATED SCIENCES AT THE INTERMEDIATE SCHOOLS IN THE ARAB STATES	M. S. Selim	13-15	integ	Arabic	10
PILOT PROJECT FOR BIOLOGY TEACHING AT THE SECONDARY SCHOOLS IN THE ARAB STATES	M. S. Selim	16-18	b	English, Arabic	10
PILOT PROJECT FOR IMPROVEMENT OF MATHEMATICS TEACHING IN THE ARAB STATES (See: UNESCO Mathematics Project for the Arab States)	G. Soos	14-18	m,s		6
UNESCO MATHEMATICS PROJECT FOR THE ARAB STATES (See: Pilot Project for the Improvement of Mathematics Teaching in the Arab States)	G. Soos	14-18	m,s	English	7
UNESCO PILOT PROJECT FOR CHEMISTRY TEACHING IN ASIA	J. Zyka E. Watton L. E. Strong	15-18	c	English	6,5,4
UNESCO SCIENCE TEACHING PROJECT IN ASIA	J.A. Campbell	14-18 TEd	c	English, Thai	7

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
AUSTRALIAN AREA					
American Samoa					
SAMOAN CURRICULUM IN SCIENCE (SCIS)	J. Bromley	6-13	b,c,p	English, Samoan	9
SAMOAN SEA STUDY LABS (SSSL)	R.L. Needham	15-17	m-s	English, Samoan	9
Australia					
AUSTRALIAN ACADEMY OF SCIENCE SCHOOL BIOLOGY PROJECT	D.G. Morgan	16-17	b	English	9,8,7
AUSTRALIAN SCIENCE EDUCATION PROJECT (ASEP) (See also: Junior Secondary Science Project)	H.O. Howard	12-15	e-s,s-s, b,c,p, an	English	9,8,7
AUSTRALIAN SCIENCE TEACHER EDUCATION PROJECT (ASTEP)	D. Driscoll P.J. Fensham	TEd	b,c,p, e-s	English	9,8
THE CANBERRA MATHEMATICAL ASSOCIATION PAMPHLETS FOR TEACHERS	M.F. Newman	TEd	m	English	8,7
EDUCATION DEPARTMENT OF SOUTH AUSTRALIA	E.W. Golding	6-18	m,s	English	5
EDUCATION DEPARTMENT OF VICTORIA TECHNICAL SCHOOLS' SCIENCE COURSES, FORMS 1-4 (See: Technical School Science)	R.A. Armitage	12-18	g-s	English	6,5,4
EDUCATION DEPARTMENT OF WESTERN AUSTRALIA EXPERIMENTAL SECONDARY SCHOOL MATHEMATICS (YEARS 1-3) (See: Educacion Department of Western Australia High School Mathematics)	J.R. Greenway	13-15	m	English	8,6,5
EDUCATION DEPARTMENT OF WESTERN AUSTRALIA HIGH SCHOOL MATHEMATICS PROJECT (See: Education Department of Western Australia Experimental Secondary School Mathematics)	N. Hoffman	13-15	m	English	9
EDUCATION DEPARTMENT OF WESTERN AUSTRALIA LOWER SECONDARY SCIENCE PROJECT (LSS)	K. Betjeman	13-15	b,c,p, e-s	English	10

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Australia (Continued)					
INDIVIDUAL MATHEMATICS PROGRAMME (IMP)	M.L. Clark	8-12	m	English	9,8,7, 6,5,4
JUNIOR SECONDARY SCIENCE PROJECT (JSSP) (See also: Australian Science Education Project)	W.C. Radford L. Dale	12-13	b,c,p, e-s	English	9,8,7, 6,5,4
NATIONAL SCIENCE CURRICULUM MATERIALS PROJECT (NSCM)	G.R. Meyer R.T. Slattery	16-18	b,c,p,g	English	8,7
NEW SOUTH WALES JUNIOR SCIENCE INSERVICE EDUCATION PROJECT	A.J. Watson H.K. Carey	TEd	integ-s	English	10
NUCLEAR RESEARCH FOUNDATION HIGH SCHOOL SCIENCE PROJECT(See: University of Sydney Science Textbook Project: Integrated and Coordinated Science Textbook and Teachers Manual Series for High School Students and Teachers and: The Science Foundation for Physics Integrated and Multistrand Science Textbook for The New South Wales Six Year Science Course)	H. Messel	12-18	b,c,p	English	5
PHYSICAL SCIENCE - MAN AND THE PHYSICAL WORLD	P. Fensham	16-17	p-s	English	10
PRIMARY SCIENCE SCHEME OF THE TERRITORY (PSST)	J.D. Edwards	5-11	g-s	English	10
PROJECT PHYSICS (SOUTH EAST ASIA ADAPTATION)	A.A. Hukins	16-17	p	English	9,8
THE SCIENCE FOUNDATION FOR PHYSICS INTEGRATED AND MULTISTRAND SCIENCE TEXTBOOK FOR THE NEW SOUTH WALES SIX YEAR SCIENCE COURSE (SHS) (See: Nuclear Research Foundation High School Science Project and: University of Sydney Science Textbook Project.	H. Messel	12-17	b,c,p, geol astr	English	9,8,7
SCIENTIFIC WORDS NEW GUINEA (PROJECT SWING)	P.L. Gardner	12-15	b,c,p, e-s	English	9
TECHNICAL SCHOOL SCIENCE (See: Victoria Technical Schools Science Course, Forms 1-4 and : Education Department of Victoria Technical Schools' Science Courses, Forms 1-4)	G. Maclean	11-16	g-s	English	9,7

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Australia (Continued)					
UNIVERSITY OF SYDNEY SCIENCE TEXTBOOK PROJECT: INTEGRATED AND COORDINATED SCIENCE TEXTBOOK AND TEACHERS MANUAL SERIES FOR HIGH SCHOOL STUDENTS AND TEACHERS (See: Nuclear Research Foundation High School Science Project and The Science Foundation for Physics Integrated and Multistrand Science Textbook for the New South Wales Six Year Science Course)	H. Messel	12-18	b,c,p	English	6
VICTORIA DEPARTMENT OF EDUCATION SCIENCE CURRICULUM PROJECT (See: Victorian Primary Schools' Science Course)	R. W. Cowban	5-11	b,c,p, e-s	English	6,5
VICTORIA TECHNICAL SCHOOLS SCIENCE COURSE, FORMS 1-4 (See: Technical School Science)	R.A. Armitage	12-15	g-s	English	4
VICTORIAN MATRICULATION CHEMISTRY	A.S. Buchanan	18	c	English	6,5,4
VICTORIAN PRIMARY SCHOOLS' SCIENCE COURSE (See: Victoria Department of Education Science Curriculum Project)	R. W. Cowban	5-11	b,c,p, e-s	English	9
WORDS IN SCIENCE PROJECT	P. L. Gardner	12-15	g-s	English	9
Fiji					
BASIC SCIENCE, PHYSICAL SCIENCE AND BIOLOGICAL SCIENCE(See:UNDP-UNESCO Project - Secondary School)	S.L. Achal	11-16	e-e,e-s, b,c,p, s-s	English	10
PHYSICAL SCIENCE (FIJI OPTION) FOR N.Z. SCHOOL CERTIFICATE(See also: Basic Science, Physical Science, Biological Science)	D.Rao	16	p-s	English	10
UNDP-UNESCO PROJECT - SECONDARY SCHOOL(See: Basic Science, Physical Science, Biological Science)	G. Bishop	12-17	b,c,p, m,t, e-s,s-s b-e,h-e	English	9
Guam					
ENVIRONMENTAL EDUCATION FOR GUAM SCHOOLS PROJECT (EEGSP)	D. Hotaling	6-13	ecol	English Chamorro	9

Project Title (acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Papua & New Guinea					
DEPARTMENT OF EDUCATION TERRITORY OF PAPUA AND NEW GUINEA SECONDARY SCHOOLS MATHEMATICS COURSE, FORMS 1-4	K.C. Lovitt	12-16	m	English	6,5
DEPARTMENT OF EDUCATION, TERRITORY OF PAPUA AND NEW GUINEA, SECONDARY SCIENCE COURSE, FORMS 1-4	M.N. Maddock	12-16	b,c,p, geol g-s	English	7,6,5
MATHEMATICS LEARNING PROJECT (MLP)	G. Lean	17	m	English	10
SCIENCE EDUCATION PROGRAMME (SEP)	A.L. Allen	6-18	s	English	8,7
SECONDARY SCIENCE PILOT SYLLABUS	D.A. Mitchell	12-18	s	English	8
SECONDARY SCIENCE PROJECT	P.E. Deutron	12-15	g-s	English	10
Solomon Islands					
SOLOMON ISLANDS UNESCO PRIMARY SCIENCE (SIEAS)		5-13 TEd	e-e,e-s, b,m,p	English	10,9

EUROPEAN AREA

Project Title (acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Belgium					
CENTRE BELGE DE PEDAGOGIE DE LA MATHEMATIQUE	G. Papy	6-18	m	English French	10,8
Bulgaria					
LOGIC, STRUCTURE AND CONTENT OF THE GENERAL COURSE OF STUDY IN PHYSICS IN THE SECONDARY SCHOOLS OF GENERAL EDUCATION IN THE PEOPLES' REPUBLIC OF BULGARIA	M. Borissov	14-18	p	Bulgarian	8
METHODS FOR THE USE OF TECHNICAL MEANS IN THE TEACHING PROCESS	V. Metev	6-18+	b,m,p,g, l-a,t	Bulgarian	8

Project Title (acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Czechoslavakia					
CENTER FOR THE MODERNIZATION OF PHYSICS TEACHING (KABINET PRO MODERNIZACI VYUCOVANI FYZIE)	M. Vialouch	6-13	m,p	Czech, Slovak	7,6,5, 4
LONG-TERM POST GRADUATE COURSE UNESCO:"ON MODERN PROBLEMS IN BIOLOGY"	I.V. Zalabak I. Malek	adult	b	English	9,7
Denmark					
ELECTRONICS TEACHING PROJECT FOR TEACHERS AT ELEMENTARY LEVEL (ETP)	P. Vedelsby	TEd	electro	Danish	7
ASK NATURE	P. Thomsen	12-15	c,p	Danish	10
France					
AMERICAN SCHOOL OF PARIS PHYSICAL SCIENCE COURSE	D.A. Sousa	14-17	art,p,r, hist,mus, govt	French	6,5
FRENCH MINISTRY OF EDUCATION		6-12	s	French	5
INITIATION AUX SCIENCES ET TECHNIQUES (IST)	G. Delacote	11-14	c,p,e-s, en-t	French	10
PHYSICS, CHEMISTRY AND TECHNOLOGY PROGRAM FOR MIDDLE AND HIGH SCHOOLS	G. Delacote	12-18	c,p,t, astr	French	8
PREPARATION OF A COURSE ON ELEMENTARY PARTICLE PHYSICS (TEPP)	M. Nikolic	adult	p	French	7
Great Britain: England					
ADVANCED PHYSICS PROJECT FOR INDEPENDENT LEARNING (APPIL)	J.I. Bausor	18-20	p	English	10
APPLIED STATISTICS (COMPUTER BASED LEARNING) (CALSTATS)	J.R. Hartley	coll	m,s-s	English	9,8
ASSISTANCE TO COMMONWEALTH TEACHING OF SCIENCE (ACTS)	D.A. Carter	13-14	b,c,p	English	9,8
ASSOCIATION FOR SCIENCE EDUCATION	E.W. Tapper	5-18	s	English	5,4
ATTITUDE TO SCIENCE SCALES	L.S. Skurnik	14-16	s	English	9

Project Title (acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Great Britain: England (continued)					
CENTRE FOR CURRICULUM RENEWAL AND EDUCATIONAL DEVELOPMENT OVERSEAS (CREDO)	R.W. Morris	6-18 adult	s	English	6,5
THE CENTER FOR EDUCATIONAL DEVELOPMENT OVERSEAS (CEDO)	D.G. Chisman	TEd	a-v,m,s	English	8
CHELSEA SCIENCE SIMULATION PROJECT	R. Lewis	16-19	b,c,p	English	9
CHILDREN EXPLORE THEIR ENVIRONMENT - THREE FILMS	J. Howard	5-11 TEd	b,c,p, eng,art	English	9
COMPUTER AIDED LEARNING PROJECT	W.R. Broderick	13	b	English	9
COMPUTER APPRECIATION FOR SCHOOLS - COMPUTERS AND THEIR IMPACT ON BUSINESS AND SOCIETY	A.A. Robinson	16-18	c-s	English	8
COMPUTER BASED LEARNING PROJECT	J.R. Hartley	9-18	c,m,s-s, ed-t	English	10,9,8
COMPUTERS IN THE CURRICULUM	R. Lewis	14-18	b,c,p, s-s	English	9
COMPUTERS IN THE UNDERGRADUATE SCIENCE CURRICULUM (CUSC)	L.R.B. Elton	18+	b,c,p	English	9
CONCEPTS IN SECONDARY SCHOOL MATHEMATICS AND SCIENCE (CSMS)	K.W. Keohane G. Matthews	10-16	b,c,p,m	English	10
CONFERENCE OF MATHEMATICS CURRICULUM STUDY AND SCHOOL MATHEMATICS PROJECT	B. Thwaites	5-18	m	English	4
CONSERVATION EDUCATION PROJECT	P.J. Kelly	12-17	b,c,p,t, g,s-s, hist	English	9,8
CONTEMPORARY SCHOOL MATHEMATICS	A.J. Sherlock	11-18	m	English	7,6
CONTINUING MATHEMATICS PROJECT	R.W. Morris A.W. Fuller	16-18	m	English	10,9
COURSES IN TEACHING AND LEARNING IN HIGHER EDUCATION (TLHE)	L.R.B. Elton	adult TEd	b,c,p,m, t,hu,s-s	English	9
CURRICULUM DIFFUSION RESEARCH PROJECT	P.J. Kelly	adult	curr dev	English	9,8

Project Title (acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Great Britain: England (continued)					
EARLY MATHEMATICAL EXPERIENCES (EME)	G. Matthews	3-5	m	English	9
EDUCATIONAL USE OF LIVING ORGANISMS (EULO)	P.J. Kelly	6-20	b,en-s	English	9,8,7
ENGINEERING SCIENCE	L.M. Cantor	16-18	en-s	English	9
ENVIRONMENTAL EDUCATION STUDY	R.W. West	5-20	e-e	English	10
AN EVALUATION OF NEW METHODS OF TEACHING SCIENCE	J.F. Eggleston	6-18	s	English	7
HIGHER EDUCATION LEARNING PROJECT (PHYSICS)	J. Ogborn	18+	p	English	10
INDIVIDUALIZED SYSTEMS OF INSTRUCTION IN UNIVERSITY SCIENCE COURSES (ISUS) (See: Self Teaching in University Science Courses)	L.R.B. Elton	18-20 adult	c,p,t,m	English	9
INNER LONDON EDUCATION AUTHORITY 11-13 SCIENCE	D.P. Marshall	11-14	b,c,p	English	10
JUNIOR SCIENCE PROJECT	L.F. Ennever	5-13	s	English	6
MATHEMATICS 5-11 (See: Nuffield Mathematics Teaching Project)	E.A. Albany	4-11	m	English	10
MATHEMATICS AND THE DIRECT TRAINING OF BASIC CONCEPTUAL SKILLS	J.D. Williams	7-10	m	English	6
MATHEMATICS CURRICULUM: A CRITICAL REVIEW SCHOOLS COUNCIL PROJECT	J.V. Armitage H. Halberstam	12-16	m	English	10,9
MATHEMATICS FOR THE MAJORITY	P. Floyd	13-16	m	English	9
MATHEMATICS IN EDUCATION AND INDUSTRY (MEI)	S.L. Parsonson	15+	m	English	8,7,6,5
MEASUREMENT OF UNDERSTANDING OF PUPILS IN LEARNING SCIENCE	F.W. Wagner	14-16	s	English	9
MIDLANDS MATHEMATICAL EXPERIMENT	R.M. Stokes C. Hope	10-18	m	English	9,8,6, 5,4

Project Title (acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Great Britain: England (continued)					
NATIONAL DEVELOPMENT PROGRAMME IN COMPUTER ASSISTED LEARNING (NDPCAL)	R. Hooper	9-12 adult	b,c,p,m, s-s,med nuc-s g,hist	English	10
NUFFIELD A-LEVEL BIOLOGY PROJECT	P.J. Kelly W.H. Dowdeswell	16-18	b	English	9,8,7, 6,5
NUFFIELD A-LEVEL CHEMISTRY EXAMINATION PROJECT	J.C. Matthews	16-18	c	English	9,8
NUFFIELD ADVANCED CHEMISTRY PROJECT (See: Nuffield Foundation Science Teaching Project: Advanced Level Chemistry)	E.H. Coulson	16-18	c	English	9,8
NUFFIELD ADVANCED PHYSICS PROJECT (See: Nuffield Science Teaching Project: A-Level Physics Course)	J. Ogborn	16-18	p	English	9,8
NUFFIELD BIOLOGY PROJECT	W.H. Dowdeswell	11-16	b	English	5
NUFFIELD COMBINED SCIENCE PROJECT (See: Nuffield Combined Science Continuation Project)	C.D. Bingham M.J. Elwell	11-13	b,c,p e-s	English Italian Spanish	9,7,6 5,4
NUFFIELD COMBINED SCIENCE CONTINUATION PROJECT (See: Nuffield Combined Science)	C.D. Bingham	9-12	b,c,p, e-s	English	10
NUFFIELD FOUNDATION SCIENCE TEACHING PROJECT: ADVANCED LEVEL CHEMISTRY (See: Nuffield Advanced Chemistry)	E.H. Coulson	16-18	c	English	7,6
NUFFIELD FOUNDATION SCIENCE TEACHING PROJECT: NUFFIELD ADVANCED PHYSICS	P. J. Black J. Ogborn	16-18	p	English	7
NUFFIELD JUNIOR SCIENCE TEACHING PROJECT	E.R. Wastnedge	5-13	s	English	7,6,5, 4
NUFFIELD MATHEMATICS TEACHING PROJECT (See: Mathematics 5-11)	G. Matthews	5-13	m	English French Italian German	9,8,7 6,5,4

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Great Britain: England (Continued)					
NUFFIELD "O" LEVEL BIOLOGY PROJECT	G. Monger W.H. Dowdeswell	11-16	b	English	9,8,7,6
NUFFIELD "O" LEVEL PHYSICS (See: Nuffield Physics Teaching Project (O Level)	E.M. Rogers K.W. Keohane	11-16	p	English French Spanish Turkish	6,5
NUFFIELD O-LEVEL PHYSICS TEACHING PROJECT-REVISION (See: Nuffield "O" Level Physics)	E.M. Rogers E.J. Wenham	8-12	p	English	10
NUFFIELD PHYSICAL SCIENCE COURSE (See: Nuffield Science Teaching Project: Physical Science Course)	K.W. Keohane J.E. Spice	16-18	c,p	English	9,8,5
NUFFIELD PHYSICS TEACHING PROJECT (O-LEVEL)	E.M. Rogers	11-16	p	English French Spanish Japanese Turkish	9,4
NUFFIELD SCIENCE TEACHING PROJECT: A-LEVEL PHYSICS COURSE (See: Nuffield Advanced Physics Project)	J. Ogborn	16-18 TEd	p	English	6
NUFFIELD SECONDARY SCIENCE (See: Nuffield Science Teaching Project: Secondary Science Course)	H. Misselbrook	13-16	s	English	9,8
NUFFIELD SCIENCE TEACHING PROJECT: PHYSICAL SCIENCE COURSE (See: Nuffield Physical Science)	J.E. Spice	16-18	p-s	English	6
NUFFIELD SCIENCE TEACHING PROJECT: SECONDARY SCIENCE COURSE (See: Nuffield Secondary Science)	H. Misselbrook	13-16	s	English	6
NUFFIELD "WORKING WITH SCIENCE"	K. Wild	16-19	s,s-s	English	10
THE OPEN UNIVERSITY IN GREAT BRITIAN		18+	all	English	8
PILOT DEVELOPMENT PROJECT IN APPLIED SCIENCE AND TECHNOLOGY		13-16	en,t eng	English	5

Project Title (acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Great Britain: England (continued)					
PHYSICAL SCIENCES PROGRAM EXCHANGE (PSPE)	G. Beech	adult	b,c,p, ed-t	English	10
PROGRESS IN LEARNING	W. Harlen	5-13	m,s	English	9
PROJECT TECHNOLOGY (See: Schools Council Project Technology)	G.B. Harrison	11-18	t	English	9
THE PSYCHOLOGY AND MATHEMATICS PROJECT	R.R. Skemp	11-15	m	English	9,7,6 5
REDUCED SCIENCE COURSES SUITABLE AS A PREPARATION FOR NORMAL UNIVERSITY HONORS COURSES IN SCIENCE	L.R.B. Elton	18+	s	English	8,7
A RESEARCH PROJECT IN THE ACCELERATED TEACHING OF HIGHER LEVEL MATHEMATICS	E.D. Tagg	18+	m	English	7
SAINT DUNSTAN'S MATHEMATICS SYLLABUS (See: Contemporary School Mathematics)	A.J. Sherlock	11-15	m	English	5
THE SCHOOL MATHEMATICS PROJECT (SMP)	B. Thwaites	11-18	m	English	8,7,6 5,4
THE SCHOOLS COUNCIL		6-18	m,s,t	English	5
SCHOOLS COUNCIL CITY SCENE PROJECT SCIENCE FOR THE LESS ABLE PUPIL	F.L. Darrall	14-16	b,c,p	English	10
SCHOOLS COUNCIL CURRICULUM ENRICHMENT PROJECT FOR GIFTED CHILDREN	E. Ogilvie	7-11	b,e-s	English	9
SCHOOLS COUNCIL INTEGRATED SCIENCE PROJECT (SCISP)	R.C. Landbeck W.C. Hall	13-16	b,c,p,t, e-s,s-s	English	9,8
SCHOOLS COUNCIL MATHEMATICS FOR MAJORITY CONTINUATION PROJECT	P. Kaner	13-16	m	English	9,8
SCHOOLS COUNCIL PRIMARY MATHEMATICS PROJECT	J. Wrigley	5-11	m	English	9
SCHOOLS COUNCIL PROJECT FOR THE EVALUATION OF SCIENCE TEACHING METHODS	M. Galton	14-15	b,c,p	English	9,8
SCHOOLS COUNCIL PROJECT: HEALTH EDUCATION 5-13	D.T. Williams	5-13	b,h,hu, s-s	English	9

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Great Britain: England (Continued)					
SCHOOLS COUNCIL PROJECT TECHNOLOGY (See: Project Technology)	G.B. Harrison	11-18	t	English	8
SCHOOLS COUNCIL/READING UNIVERSITY, SIXTH FORM MATHEMATICS CURRICULUM PROJECT (See: Sixth Form Mathematics Curriculum Project)	C.P. Ormel	16-18	m	English	8
SCHOOL TECHNOLOGY PROGRAM	G.C. Sneed	14-18	en-s,p	English	8
SCIENCE 5/13 (Sc 5/13)	L. Ennever	5-13	b,c,p,m, s-s,s	English	9,8,7
SCIENCE TEACHER EDUCATION PROJECT (STEP)	C.R. Sutton J.T. Haysom	TEd	s	English	9,8,7
SCIENCE, TECHNOLOGY AND SOCIETY	D. Layton	TEd	s,s-s,t	English	8
SELF TEACHING IN UNIVERSITY SCIENCE COURSES	L.R.B. Elton	18-20	en-s,s	English	8,7
SHROPSHIRE MATHEMATICS EXPERIMENT (SME)	R.S. Heritage	11-16 TEd	m	English	9,8,7, 6,5
SIXTH FORM MATHEMATICS CURRICULUM PROJECT (6 FMC) (See: Schools Council/ Reading University, Sixth Form Mathematics Curriculum Project)	C.P. Ormell	16-18	m	English	10,9,7
SIXTH FORM TECHNOLOGY PROGRAM	L.R.B. Elton	16-18	s,t	English	7
TEACHING SCIENCE OUTDOORS	P.E. Richmond	11-15	b,c,p,m	English	10
UNIVERSITY PHYSICS ITEM BANK	L.R.B. Elton	18-20 adult	p	English	9
Great Britain: Scotland					
ALTERNATIVE SYLLABUSES IN PHYSICS AND CHEMISTRY FOR SECONDARY SCHOOLS	A. J. Mee W. R. Ritchie	12-17	p,c	English	7,6,5,4
BIOLOGY TEACHING UNIT (See: Inter-University Biology Teaching Project)	G. Manwaring	18+	b	English	9
CERTIFICATE OF SIXTH YEAR STUDIES IN BIOLOGY	P. Smith	17-18	b	English	9

Project Title (acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Great Britain: Scotland (continued)					
DEVELOPMENT OF IDEAS IN MATHEMATICAL EDUCATION PROJECTS (DIME PROJECTS)	G. Giles	5-adult	m	English	10
FIFE MATHEMATICS PROJECT	G. Giles	11-13	m	English	10,9
FURTHER AND HIGHER EDUCATION SERVICE MATHEMATICS (MATLAP)	D.F. Leach	17-adult	m	English	10
INTER-UNIVERSITY BIOLOGY TEACHING PROJECT (LUBTP) (See: Biology Teaching Unit)	G. Manwaring	18+	b	English	8
MATHEMATICS FOR GENERAL EDUCATION	J. Nisbet	14-16	m,s-s	English	10,9
PROGRAMMED MATERIALS FOR THE HIGHLANDS AND ISLANDS OF SCOTLAND (PROJECT PHI)	M. Roebuck	12-14	integ.	English	8
SCIENCE IN S1 AND S2	J.A.R. Hughes	12-13	b,c,p	English	10
SCOTTISH EDUCATION DEPARTMENT MATHEMATICS EXPERIMENT	J. Nisbet	12-16	m	English	10,9,8
SCOTTISH INTEGRATED SCIENCE COURSE	W.R. Ritchie	12-14	b,c,p	English	7
SCOTTISH MATHEMATICS GROUP (SMG)	P. Whyte	12-18	m	English Spanish Dutch, Malay Swedish	9,8,7
SCOTTISH SECONDARY SCIENCE SCHEMES	A.W. Jeffrey	12-18 TEd	b,c,p	English	9,8
WORKING PARTY FOR SECONDARY SCHOOL SCIENCE	A.J. Mee	12-16	b,c,p	English	6
Great Britain: Wales					
DEVELOPMENT OF SCIENTIFIC AND MATHEMATICAL CONCEPTS	J. Rogers	7-11	m,s	English	9
EARLY STAGES OF MATHEMATICAL DEVELOPMENT WITH YOUNGER CHILDREN (3 years to 9 years)	W.J. Emery	5-9	m	English	10

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Great Britain: Wales (Continued)					
LOWER VALLEY PROJECT IN MATHEMATICS (See: Valley Project in Mathematics)	W.J. Emery	5-13	m	English	7
PHYSICS INTERFACE PROJECT (PIP) (See: School University Physics Interface Project)	C. A. Taylor	adult	p	English	9
SCHOOL UNIVERSITY PHYSICS INTERFACE PROJECT (See: Physics Interface Project)	R. A. Sutton	adult	p	English	8
SWANSEA SCHEME	J. D. Weston	16-18	m	English	9,8,7, 6,5
VALLEY PROJECT IN MATHEMATICS (See: Lower Valley Project in Mathematics)	W. J. Emery	5-13	m	English	9,8
Hungary					
CURRICULUM PROJECT FOR SPECIAL CLASSES IN CHEMISTRY AND PHYSICS (BIOLOGY) SECONDARY SCHOOL FOURTH GRADE	K. Garami	16-18	b,c,p	Hungarian	6,5,4
OPI MATHEMATICAL REFORM PROJECT	E. Hodi	5-18	m	Hungarian	10,9,6, 5,4
A PROJECT FOR UPDATING MATHEMATICS TEACHING ON A SECONDARY SCHOOL LEVEL IN HUNGARY	J. Suranyi	15-18	m	Hungarian	9
Ireland					
INTEGRATED SCIENCE CURRICULUM INNOVATION PROJECT (ISCIP) (See: Irish Science Curriculum Innovation Project)	B. Rosney	12-15 TEd	b,c,p,t, e-s,s-s	English	10
IRISH SCIENCE CURRICULUM INNOVATION PROJECT (ISCIP) (See: Integrated Science Curriculum Innovation Project)	B. L. Powell M. Freestone	13-15	b,c,p,t, e-s,s-s	English	9
Italy					
ACTIVITY-BASED PHYSICS COURSE	M. Palma-Vittorelli	14-16	p	Italian	8

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Italy (Continued)					
INIZIATIVA RELATIVITA (IR) (See: Iniziativa Relativita Per Le Scuole Secondarie)	G. Cortini	17-18+	p	Italian	10
INIZIATIVA RELATIVITA PER LE SCUOLE SECONDARIE (IRSS) (See: Relativity for the Secondary School and: Iniziativa Relativita)	G. Cortini	16-18	p,h-s	Italian	9
PROJECT FOR A MODERN TEACHING OF BIOLOGY IN SECONDARY SCHOOLS	L.L.C. Sforza	15-19	b,c,p, ecol	Italian	6
PROJECT FOR A MODERN TEACHING OF CHEMISTRY IN SECONDARY SCHOOLS	A. Liberti	14-18	c	Italian	6,5,4
PROJECT FOR A MODERN TEACHING OF MATHEMATICS IN SECONDARY SCHOOLS	M. Villa	14-18	m	Italian	6,5
PSSC PILOT EXPERIMENT	G. Puppi	15-19	p	Italian	6,5
RELATIVITY FOR THE SECONDARY SCHOOL (See: Inziativa Relativita Per Le Scuole Secondarie)	G. Cortini	16-18	p,h-s	Italian	8
THE STRUCTURE OF MATTER (AN ACTIVITY BASED SCIENCE COURSE)	M. Palma-Vittorelli	14-15	b,c,p, integ.	Italian	10
The Netherlands					
ACHIEVEMENT TESTS FOR PHYSICS, MATH AND CHEMISTRY	P.K. Broekman	14-17	b,c,m	Dutch	10
ARITHMETIC FOR DOMESTIC SCHOOLS (See: The Testing of an Arithmetic Didactics in the Transitional Year of Technical and Domestic Science Training for Girls)	W. Brandenburg	13-14	m	Dutch	9
THE CONSTRUCTION OF AN ITEM BANK FOR SECONDARY SCHOOL MATHEMATICS	J. Timmer A.D. deGroot	12-15	m	Dutch	9,8,7
EXPERIMENTAL CHEMISTRY FOR THE SECONDARY SCHOOL	J. de Miranda Tilburg	14-17	c	Dutch	7
GROUP THEORY WITH TWELVE YEAR OLDS USING THE DIENES METHOD	B. vander Krogt	12	m	Dutch	8,7

Project Title (acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
The Netherlands (continued)					
PHYSICS CURRICULUM DEVELOPMENT PROJECT FOR GENERAL SECONDARY EDUCATION - PROJECT LEERPAKKETONTWIKKELING NATUURKUNDE (PLON)	H.P. Hoomayers	13-15	p	Dutch	10,9
A PROGRAMMED FIRST COURSE IN ALGEBRA (HYBRID FORM)	L. Bunt	12-15	m	Dutch	6
REKENPROJEKT S.V.O. 096	W.J. Brandenburg	14-18	m	Dutch	7
RENOVATION OF CHEMISTRY CURRICULA IN SECONDARY SCHOOLS (CMLS)	D.P. den Os	6-18 TEd	c	Dutch	9,8
THE TESTING OF AN ARITHMETIC DIDACTICS IN THE TRANSITIONAL YEAR OF TECHNICAL AND DOMESTIC SCIENCE TRAINING FOR GIRLS (See: Arithmetic for Domestic Schools)	W.J. Brandenburg	13-14	m	Dutch	8
VAN A TOT Z: WERKBOEKEN DER WISKUNDE (MATHEMATICAL COURSE FOR SECONDARY EDUCATION (A-Z)	P.M. van Hiele	12-19	m	Dutch	9,8,7
Norway					
ACTIVE PHYSICS/CHEMISTRY PROJECT AND ACTIVE BIOLOGY	H. Olsen	13-16	b,c,p	Norwegian	10
ENVIRONMENTAL EDUCATION IN PRIMARY SCHOOL	B. Bjorndal	5-11	integ. e-e	Norwegian	10
Poland					
PRIMARY TEACHING OF MATHEMATICS	Z. Semadeni	5-11	m	Polish	9
Portugal					
MODERIZATION OF THE TEACHING OF MATHEMATICS IN SECONDARY SCHOOLS	J.S. e Silva	15-18	m	Portugese	6,5,4
PROJECT FOR A MODERN TEACHING OF CHEMISTRY IN SECONDARY SCHOOLS	F. Pinto-Coelho	15-18	c	English, Portugese	6,5

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Romania					
EXPERIMENT ON THE SYSTEMATIC TEACHING OF PROBABILITY	E. Fischbein	9-12	m	Romanian	9,8,7,6
Spain					
CANARY ISLANDS MATHEMATICS PROJECT (CIMP)	J. B. Morata	5-13	m	Spanish	9,8,7, 6,5
Sweden					
INDIVIDUALIZED MATHEMATICS INSTRUCTION INDIVIDUALISERAD MATEMATIK-UNDERVISNING (IMU)	C. Oreberg	12-14	m	English, Swedish	7,6
Switzerland					
DEVELOPMENT AND CORRESPONDING ANALYSIS OF CURRICULUMS FOR THE PRIMARY SCHOOL	K. Aregger	6-12			8
DEVELOPMENT AND CORRESPONDING ANALYSIS OF THE CURRICULUM FOR CONTINUING SCHOOLS IN ZUG (ENTWICKLUNG UND BEGLEITENDE ANALYSEN DES CURRICULUMS DER WEITERBILDUNGSSCHULE ZUG) (EBAC-WS)	B. Santini	15-16	integ. h,s-s, l-a	German	10,9,8
SCHULMATEMATIK UND ALLGEMEINE LERNZIELE (SL)	E. A. Kramer	6-14	m	German	9
Turkey					
FEN ORGRETIMINI GELISTRME PROJESI	B. K. Baloglu	16-18	b,c,p,m	Turkish	7
MOBILE UNITS FOR SCIENCE TEACHING	R. Nasuhoglu	15-17	p	Turkish	6,5,4
SCIENCE EDUCATION DEVELOPMENT COMMISSION BOARD OF EDUCATION OF THE MINISTRY OF EDUCATION	Z. Baloglu	15-18	s,s-ed	Turkish	6
SCIENCE TEACHING DEVELOPMENT PROJECT	Z. Baloglu B. K. Kerpicci	15-18	b,c,p,m	Turkish	9,8
TURKISH MINISTRY OF EDUCATION NATIONAL SCIENCE LISE PROJECT	R. Nasuhoglu	15-17	b,c,p,m	Turkish	5

Project Title (acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
West Germany					
ANALYSIS OF THE EVOLUTION OF A SCIENCE CONCEPT: MACROMOLECULES	J. Minssen	TEd	b,c,p s-s hist	German English	10
COMPUTER BASED INSTRUCTION AS A TOOL FOR PEDAGOGICAL RESEARCH	K. Eckel	13-15	p	German	9
CURRICULUM STUDIES	S. Robinsohn D. Knab	14-18	b,c,p	German	7
ECOLOGICAL AND ENVIRONMENTAL EDUCATION (See: Ecology in Schools)	G. Eulefeld	2-20	b,c,p, e-s,s-s	German	10
ECOLOGY IN SCHOOLS (See: Ecological and Environmental Education	G. Eulefeld	2-20	b,c,p, e-s,s-s b,c,p	German	9
ENTWICKLUNG EINES NATURWISSENSCHAFTLICH ORIENTIERTEN PRIMARSCHULCURRICULUM	H. Tutken	5-8	b,c,p	German	9
FRANKFURTER PROJECT	H. Bauersfeld	5-11+	m	German English	6,7
INSTITUT FUR BILDUNGSFORSCHUNG IN DER MAX-PLANCK GESELLSCHAFT	S. Robinsohn D. Knab	14-18+	b,c,p	German	6,5
INSTITUT FUR DIDAKTIK DER MATHEMATIK (IDM)	H. Bauersfeld	6-17	m	German	
INTEGRATED NATURAL SCIENCE CURRICULUM (PROJEKT INTEGRIETES NATUURIM CURRICULUM (PINC)	W. Quitzow	12-15	b,c,p,t	German	10,9
INTRODUCTION OF EXPERIMENTS INTO CLASSES	K. Eckel	15-16	electric	German	7
INVESTIGATIONS OF THE METHODOLOGY AND STRATEGY FOR THE CONSTRUCTION OF INTEGRATED SCIENCE CURRICULUM	P. Haussler K. Frey			German	9,8
INSTITUT FUR DIE PADAGOGIK NATURWISSENSCHAFTEN (IPN):					
INSTITUTUE OF THE PADAGOGY OF SCIENCE (IPN)	K. Hecht	5-18+	s	German	4
INSTITUTE FOR THE TEACHING OF PHYSICAL SCIENCES (IPN)	K. Hecht	5-18+	s	German .	6,5

Project Title (acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
INSTITUT FUR DIE PADAGOGIK NATURWISSENSCHAFTEN (IPN) (continued)					
INSTITUTE FOR EDUCATION IN NATURAL SCIENCE (IPN)	K. Hecht	5-18+	s	German	7
IPN CURRICULUM BIOLOGY	G. Schaefer	10-19	b	German	8
IPN CURRICULUM CHEMIE 5/6	J. Weninger	10-11	b,c,p, eng-t	German	9,8
IPN CURRICULUM CHEMIE 8/13 (See: IPN-Lehrgang "Stoffe und Stoffumbildungen" 8/13)	J. Weninger	14-19	c,p	German	9,8
IPN CURRICULUM PHYSIK 5/8 (IPN P 5/8)	H.J. Niedderer	10-TEd	p	German	9,8
IPN CURRICULUM PHYSIK 9/10 (IPN P 9/10)		14-16	p,s-s, eng-t	German	9,8
IPN-LEHRGANG "STOFFE UND STOFFUMBILDUNGEN" 8/13 (See: IPN-Curriculum Chemie 8/13	J. Weninger	8-12	c,p	German	10
MATHEMATIK IN DER GRUNDSCHULE	A. Fricke	6-12	m	German Sp, Dutch	8,7
MODELS OF AN INTEGRATIVE MULTIPERSPECTIVE INSTRUCTION IN PRIMARY SCHOOL EDUCATION	G.G. Hiller	6-11	b,c,p,m, s-s,t	German	9
NATURWISSENSCHAFTLICHER UNTERRICHT IN DER GRUNDSCHULE (NUG) (See: Science Teaching in the Elementary School)	K. Sprekelsen	7-10	c,p	German	9,8
PROGRAM NATURWISSENSCHAFTEN	K. Frey	5-7 TEd	g-s	German	10,9
SCIENCE EDUCATION FOR GRADES 11-13 WITH BOTH VOCATIONAL AND ACADEMIC EMPHASIS	K. Frey	16-18	b,c,p, s-s, eng-t	German	10
SCIENCE TEACHING IN THE ELEMENTARY SCHOOL (See: Naturwissenschaftlicher Unterricht in der Grundschule)	K. Sprekelsen	7-10	c,p	German	7
UNIT BANK BIOLOGY	G. Schaefer	9-17	b,c,m, s-s,cyb	German	10,9,8

Project Title (acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
West Germany (continued)					
USE OF COMPUTER BASED INSTRUCTION FOR THE IMPROVEMENT OF BOOK PROGRAMS	K. Eckel			German	8
Yugoslavia					
MODERNIZATION OF SECONDARY SCHOOL MATHEMATICS IN SLOVENIA	S. Ursic	15-17	m	Slovene	7
TEXTBOOK OF ELEMENTARY PARTICLE PHYSICS (TEEP)	M.M. Nickolic	18+	p		8
EUROPEAN AREA					
European Regional Projects					
NORDIC COMMITTEE FOR THE MODERNIZING OF SCHOOL MATHEMATICS	L. Sandgren	6-18	m	Danish Swedish Norwegian Finnish	7,6,5,4
NORWEGIAN-SWEDISH PHYSICS PROJECT	I. Karlstrom	15-18	p	Norwegian Swedish	4
SCANDINAVIAN CHEMISTRY COMMITTEE	I. Karlstrom	15-18	c	Norwegian Swedish	4
THE SCANDINAVIAN PHYSICS PROJECT FOR THE MODERNIZING OF HIGH SCHOOL PHYSICS	K.G. Friskopp	16-19	p	Norwegian Swedish Finnish	8,7,6, 5
THE SPECIAL PROJECT STP-5/SP SCANDINAVIA FOR PILOT COURSES IN CHEMISTRY	G. Ahman	14-16	c	Norwegian Swedish	7,6,5
LATIN AMERICAN AREA					
Argentina					
CENTER FOR THE STUDY OF SCIENCE TEACHING (CESEC)	A. Maiztegui I.R. Ferreyra	15-18 TEd	p	English Spanish	7
CURSO EXPERIMENTAL DE MATEMATICA (3^{er} ano)	R. Ocerin	15	m	Spanish	9
DEPARTMENT OF EDUCATIONAL TELEVISION	J.M.C. Rios	16-adult	b,c,p, geol	Spanish	6,5

Project Title (acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Argentina (continued)					
ENSENANZA ACTUALIZADA DE LA QUIMICA - FIRST & SECOND COURSES (Current Teaching of Chemistry, First and Second Courses)	R. Ocerin	17	c	Spanish	9
HEALTH EDUCATION (Educación para la Salud)	R. Ocerin	16	b	Spanish	9
IMPROVEMENT OF THE CURRICULUM PROGRAM IN MENDOZA PROVINCE, ARGENTINA REPUBLIC	M. de Salomone	6-12 TEd		Spanish	8
INTRODUCTORY PHYSICAL SCIENCE (IPS)	H. Ruival	15	c,p	Spanish	9
PILOT PROGRAM OF BIOLOGY I: "LIVING THINGS IN THEIR ENVIRONMENT" (programa Piloto de Biología I: "Los Seres Vivos en su ambiente")	R. Ocerin	12	b.	Spanish	9
PILOT PROGRAM OF BIOLOGY II: "THE DIVERSITY OF LIVING THINGS" (Programa Piloto de Biología II: "La Diversidad de los Seres Vivos")	R. Ocerin	13	b	Spanish	9
PILOT PROGRAM OF BIOLOGY III: "STRUCTURES & FUNCTIONS OF ORGANISMS" (Programa Piloto de Biología III: "Estructura y Funcionamiento de los Organismos")	R. Ocerin	14	b	Spanish	9
PILOT PROGRAM FOR BIOLOGY IV: "INTEGRATION, CONTINUITY & EVOLUTION OF LIVING THINGS" (Programa Piloto de Biología IV: "Integración, Continuidad y Evolución de los Seres Vivos")	R. Ocerin	15	b	Spanish	9
VERBAL & MATHEMATICAL REASONING TESTS		14-16		Spanish	9
Brazil					
"BIOLOGIA NORDESTE"- A BRAZILIAN CURRICULUM PROPOSED FOR THE NORTHEAST	O. F. Pessoa	15-18	b	Portuguese	7

Project Title (acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Brazil (continued)					
CENTRO DE ENSINO DE CIENCIES DA BAHIA (CECIBA) (See: Science Teaching Center of Bahia)	J.W.B. Vidal	14-18	ed-t,s, s-ed	Portuguese	6,5
FUNDACAO BRASILEIRA PARA O DESENVOLVIMENTO DO ENSINO DE CIENCIAS (FUNBEC) See: Science Education Projects for Primary, High School and College Level)	E. Giesbrecht I. Raw	6-18	m,b,c,p, e-s,g-s phys	Eng, Sp, Portuguese	8,5
GRUPO DE ESTUDOS DO ENSINO DA MATEMATICA (GEEM)	O. Sangiorgi	TEd	m	Portuguese	9,7
INTEGRATED SCIENCE (CIENCIA INTEGRADA)	M. Krasilchik	15-16	b,c,p,m, e-s ,s-s, t,integ.	Portuguese	10,9
INTEGRATED SCIENCE FOR RECENTLY ALPHABETIZED ADULTS	P. dos Santos		electric h	Portuguese	9
SCIENCE EDUCATION PROJECTS FOR PRIMARY, HIGH SCHOOL AND COLLEGE LEVEL (FUNBEC) (See: Fundacao Brasileira Para O Desenvolvimento Do Ensino De Ciencias (FUNBEC)	E. Geisbrecht I. Raw	5-adult	m,b,c,p, e-s,g-s, g,astr.	Portuguese	7,6
SCIENCE MATHEMATICS AND SOCIAL STUDIES - 1ST GRADE	A. De Souza	6-13	m,b,c, s-s,p	Portuguese	10
SCIENCE TEACHING CENTER OF BAHIA (See: CENTRO DE ENSINO DA CIENCIAS DA BAHIA - CECIBA)	J.W.B. Vidal	14-18	ed-t,s s-ed	Portuguese	4
SEMI-CONDUCTORS	A. de Souza Teixeira	adult	p,t	Portuguese	4
TECHNICAL TEACHING OF ELECTRONICS (PEPE)	A. de Souza Teixeira	15-17	p,ed-t	Portuguese	10
Chile					
INTRODUCTORY LABORATORY PHYSICS	J.A. Eades	18+	p	Spanish	8
PROGRAMA DE PERFECCIONAMIENTO (See: Program of Improvement)	H. Croxatto	5-18	m,s,s-s l-a	English Spanish	6,5
PROGRAM OF IMPROVEMENT (See: Programa de Perfeccionamiento)	H. Croxatto	5-18	m,s,s-s, l-a	English Spanish	4

Project Title (acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Chile (continued)					
PROYECTO DE PERFECCIONAMIENTO EN SERVICIO, CIENCIAS NATURALES (PPS-CN)	A. Labarca	10-13 TEd	b,c,p, e-s	Spanish	10,9,8, 7
Colombia					
BIOLOGIA: EL HOMBRE Y SU AMBIENTE (Biology: Man and His Environment) (See: Production of BSCS Materials Translated and Adopted to the Tropical Environment and: BSCS-Green Version Translation and Adaptation into Spanish for Tropical Latin-American Countries)	G. Roldan	16-17	b	English Spanish	9,8
BSCS-GREEN VERSION TRANSLATION AND ADAPTATION INTO SPANISH FOR TROPICAL LATIN-AMERICAN COUNTRIES (See: Production of BSCS Materials Translated and Adapted to the Tropical Environment and: Biologia: El Hombre y Su Ambiente)	F. Heredia-Cano	14-17	b	English Spanish	7
IMPROVEMENT OF SCIENCE TEACHING IN COLOMBIA	A. Ospina	14-18	m,c,g,p	Spanish	7,6,5
PRODUCTION OF BSCS MATERIALS TRANSLATED AND ADAPTED TO THE TROPICAL ENVIRONMENT (See: Biologia: El Hombre y Su Ambiente and: BSCS-Green Version Translation and Adaptation into Spanish for Tropical Latin-American Countries)	H. Gomez	14-15	b	English Spanish	6,5,4
Costa Rica					
CENTER FOR THE PREPARATION OF TEACHING MATERIALS FOR SCIENCE INSTRUCTION	M.H. Ricci	6-12 TEd	p-s,s,p	Spanish	8,7

Project Title (acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Cuba					
STUDY GROUP FOR CURRICULUM DEVELOPMENT	R.J. Montero		c,p,s	Spanish	6
Honduras					
ENSENANZA DE CIENCIAS (SCIENCE TEACHING)	M.H. Ricci	15-18 adult	m,b,c,p	Spanish	6,5
Jamaica					
PHYSICS AND MATHEMATICS CENTRE (See: University of the West Indies Science Teaching Education Centre, MONA)	K.W. Warren	5-18 TEd	m,p	English	6,5
Peru					
INSTITUTE FOR THE ADVANCEMENT OF BIOLOGY TEACHING (See: Instituto Para La Promoción De La Enseuanza De La Biología)	M. Vegas	TEd adult	b,s-ed	Spanish	5,4
INSTITUTO PARA LA PROMOCION DE LA ENSENANZA DE LA BIOLOGIA (See: Institute for the Advancement of Biology Teaching)	R. Ishiyama	TEd	b,s-ed	Spanish	6
INSTITUTO PARA LA PROMOCION DE LA ENSENANZA DE LAS MATEMATICAS (INSTITUTE FOR THE ADVANCEMENT OF MATHEMATICS TEACHING)	J. Tola	adult	m	Spanish	6,5
Trinidad					
WEST INDIAN SCIENCE CURRICULUM INNOVATION PROJECT (WISCIP)	H. Thompson B. Powell	11-14	c,b,p, integ.	English	7
Uruguay					
CIENCIAS, UNA INTRODUCCION SISTEMATICA	J. Lagomarsino	6-12 TEd	s	Spanish	6

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Virgin Islands					
ENVIRONMENTAL STUDIES PROGRAM (ESP)	D. Jadan	8-13 adult	e-e	English, Spanish	10
West Indies Regional					
CARIBBEAN MATHEMATICS PROJECT (CMP)	D.R. Broomes	11-15	m	English	9
CARIBBEAN INTEGRATED SCIENCE CURRICULUM		15-16	integ-s	English	10
CENTER FOR EDUCATIONAL DEVELOPMENT OVERSEAS, UNIVERSITY OF THE WEST INDIES CARIBBEAN REGIONAL SCIENCE PROJECT (CRSP) (See: West Indies Science Curriculum Innovation Project/C)	P. S. Adey A. J. Mee				8
INTRODUCTION OF SOME CONCEPTS IN MATHEMATICS TO PRIMARY AND SECONDARY SCHOOLS	S. A. Shah	15 16	m	English	6
MONA Published Title: NEW WORLD SCIENCE (See: University of West Indies Science Education Project)	J. Reay	12-13	integ-s	English	New Title (1976)
ST. LUCIA MATHEMATICS PROJECT (SLMP)	C. Stephen	6-12	m	English	8
STRUCTURAL MATERIALS FOR TEACHING MATH TO INFANTS: "NEW IDEAS" IN MATHEMATICS FOR CHILDREN (AGE 12-15 years)	S. A. Shah	12-15	m	English	5,4
UNIVERSITY OF THE WEST INDIES SCIENCE EDUCATION PROJECT, MONA, JAMAICA (MONA) (See: Physics and Mathematics Centre and: MONA, New World Science)	A. D. Turner J. F. Reay	12-15	b,c,p, e-s	English	9,8
WEST INDIAN SCIENCE CURRICULUM (WISC), CARIBBEAN REGIONAL SCIENCE PROJECT (CRSP) (See: West Indian Science Curriculum Innovation Project/C)			integ-s	English	New Title (1976)

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
West Indies Regional (Continued)					
WEST INDIAN SCIENCE CURRICULUM INNOVATION PROJECT/C (WISCIP/C) (See: Center for Educational Development Overseas, University of the West Indies Caribbean Regional Science Project and: West Indian Science Curriculum, Caribbean Regional Science Project)		11-14	b,c,p, integ.	English	9
Latin American Regional Projects					
INTER-AMERICAN PROGRAM FOR THE IMPROVEMENT OF SCIENCE TEACHING PROJECT 212	H.G. de Souza	TEd	s-ed,m,s	Spanish	7,6
UNESCO PILOT PROJECT ON THE TEACHING OF PHYSICS IN LATIN-AMERICA	P. Bergvall	14-18 TEd	p	Eng,Fr,Sp, Portuguese	7,6
NORTH AMERICAN AREA					
Canada					
ALBERTA ELEMENTARY SCIENCE PROJECT	N.M. Purvis	5-12	s	English	6,5,4
CENTRE DE RECHERCHES EN PSYCHO-MATHEMATIQUES, PROJECT MATHEMATIQUE DE SHERBROOKE (See: Project Mathématique de Sherbrooke, Université de Sherbrooke and: Sherbrooke Mathematics Project)	Z.P. Dienes	6-9	m	Dutch,Eng, Fr,Sp,It, German, Portuguese	8,6
CURRICULUM RESOURCES INFORMATION BANK PROJECT (CRIB) (See: Edmonton Junior High School Science Resource Bank Project)	R.A. Roberts	12-14 TEd	b,p	English	9
EDMONTON JUNIOR HIGH SCHOOL PROCESS APPROACH PROJECT	M. A. Nay	13-15 TEd	b,p	English	9,7
EDMONTON JUNIOR HIGH SCHOOL SCIENCE RESOURCE BANK PROJECT (See: Curriculum Resources Information Bank Project)	M. A. Nay R.N. Davidson	12-14 TEd	b,p	English	8,7

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Canada (Continued)					
ELEMENTARY SCIENCE PROJECT OF THE ONTARIO CURRICULUM INSTITUTE (See: Ontario Teachers Federation Science Project)	D.A. Roberts	TEd	s-ed	English	7
THE EXPLANATORY MODES PROJECT	D.A. Roberts	14-18	s-ed,s	English	8
GENERAL EDUCATION PROGRAM IN NATURAL SCIENCE (See: Natural Science Program in General Education)	T.H. Leith	18+	b,s,e-s, p-s	English	7
NATURAL SCIENCE PROGRAM IN GENERAL EDUCATION (See: General Education Program in Natural Science)	T.H. Leith C. B. Cragg	18+	b,s,e-s, p-s	English	6,5,4
ONTARIO TEACHERS FEDERATION SCIENCE PROJECT (See: Elementary Science Project of the Ontario Curriculum Institute)	D. Cooper	TEd	s-ed	English	8
PATTERNS OF ENQUIRY PROJECT (POEP)	F.M. Connelly M. Finegold	14-17 TEd	b,c,p	English	10,9
PROJECT MATHEMATIQUE DE SHERBROOKE, UNIVERSITE DE SHERBROOKE (See: Centre de Recherches en Psycho-Mathématiques, Project Mathématique de Sherbrooke and: Sherbrooke Mathématique Project)	Z. P. Dienes	6-9	m	Dutch,Eng, Fr,Sp,It, German, Portuguese	5
RESEARCHING INDIVIDUALIZED SCIENCE EDUCATION (RISE) INDIVIDUALIZED SCIENCES UPGRADING PROJECT (ISUP)	L. Brunner	18+	g-s	English	8
RESEARCHING INDIVIDUALIZED SCIENCE EDUCATION (RISE) SELF STUDY CHEMISTRY PROJECT (SSC)	L. Lorincz A. Stappler	13-17	c	English	8
RESEARCHING INDIVIDUALIZED SCIENCE EDUCATION (RISE) THE THESIS-PROGRAM INTERMEDIATE SCIENCE INDIVIDUALIZED STUDIES (THESIS-ISIS)	H. Zuurbier D. Pedherney	7-15	s	English	8

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language	ICH Reports
Canada (Continued)					
SHERBROOKE MATHEMATICS PROJECT (See: Project Mathématique de Sherbrooke, Université de Sherbrooke and: Centre de Recherches en Psycho-Mathematiques)	Z. P. Dienes	6-9	m	Dutch, Eng, Fr, Sp, It, German, Portuguese	7
THEMATIC ELEMENTARY SCIENCE INDIVIDUALIZED STUDIES (THESIS)	H. Zuurbier	6-12	s	English	7
TURN ON CHEMISTRY PROGRAM FOR NON-SCIENCE MAJOR STUDENTS (TOCP)	R.M. Kalra	16-17	c	English	9
TURN ON SCIENCE PROGRAM FOR INDIAN STUDENTS WITH A FOCUS ON VALUES (TOSP)	R.M. Kalra	12-16	b,c,p	English	9

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
AAAS COMMISSION ON SCIENCE EDUCATION (See: Science--A Process Approach)	A. Livermore J. R. Mayor	5-8	s	Spanish	6,5,4,3
AAAS SCIENCE SUPPLEMENT ENVIRONMENTAL EDUCATION ENRICHMENT ACTIVITIES	M. T. McLean	6-11	b,c,p,t s-s		9
ACCELERATED INSTRUCTION PROJECT OF THE CALIFORNIA MATHEMATICS IMPROVEMENT PROGRAMS	B. B. Frank	13-18	m		7
ACTIVITIES IN SCIENCE FOR THE EDUCABLE-MENTALLY RETARDED (AIS)	D. McLaren M. Shehorn	6-18	b,c,p		9,8,7
ACTIVITY CENTERED MATHEMATICS PROGRAM	W. B. Cooper	5-12	m, integ		8
ADAPTING SCIENCE MATERIALS FOR THE BLIND (ASMB)	H. Thier	4-14	b,c,p e-s		9,8
ADVANCED GENERAL MATHEMATICS & APPLIED BUSINESS INDUSTRIAL MATHEMATICS (AGM III & ABI MATH IV)	W. B. Hynds J. B. Cox	16-17	m		9,8,6
ADVANCE SCIENCE	W. Wright	12-14	s,e-s		2
ADVISORY COUNCIL ON COLLEGE CHEMISTRY (ACCC)	L. C. King	18+	c		7,6,5 4,3
AIBS PROJECT BIOTECH (See: Project Biotech)	R. A. Dodge	16+	b	Spanish	9
AIDS TO INDIVIDUALIZE THE TEACHING OF SCIENCE (AITS)	M. G. Spencer	13-17	b,c,p e-s		10
ALGEBRA WITH COMPUTER PROGRAMMING (See: Second course in Algebra and Trigonometry With Computer Programming)	F. Peterson	17+	m,c-s		new title (1976)
AMERICAN POLITICAL BEHAVIOR (APB)	H. Mehlinger	14-18	s-s		9
ANALYSIS OF MATHEMATICS INSTRUCTION OF THE WISCONSIN RESEARCH AND DEVELOPMENT CENTER FOR COGNITIVE LEARNING (AMI)	T. A. Romberg	5-12	m		8
ANNOTATED BIBLIOGRAPHY OF EXPERIMENTAL SCIENCE PROJECTS	J. R. Wailes	6-12	s		7,5

*Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
ANTHROPOLOGY CURRICULUM PROJECT	M. J. Rice	5-17	an		10,9,8,7
ANTHROPOLOGY CURRICULUM STUDY PROJECT	M. Collier	12-18	an		8,7,6,5,4
APPLICATION OF MATHEMATICAL LEARNING THEORY TO SECOND-LANGUAGE ACQUISITION WITH PARTICULAR REFERENCE TO RUSSIAN	P. Suppes	18+	Russian	Russian	6
THE ARITHMETIC PROJECT COURSE FOR TEACHERS (See: University of Illinois Arithmetic Project)	D. A. Page	TEd	m		9
ARLINGTON COUNTY K-12 CURRICULUM DEVELOPMENT PROJECT	H. M. Wilson	5-18	s		6,5,4,3
AUDIO-TUTORIAL BIOLOGY IN THE SECONDARY SCHOOL (See: Implementing Auto-Tutorial Biology in Secondary Schools)	K. H. Bush	13-14	b		9,8
AUDIO-TUTORIAL INDEPENDENT STUDY IN GENERAL BIOLOGY (See: General Biology Audio-Tutorial Independent Study)	C. W. Gaddis	18+	b		new title (1976)
AUDIO-TUTORIAL LABORATORY, INTRODUCTORY GEOLOGY	W. C. Sweet	18+	geol		8,7
AVAILABILITY OF SUPPLEMENTAL EDUCATIONAL RESOURCES THROUGH THE USE OF A PLANETARIUM	D. L. Bean	5-18+ Adult TEd	astr, e-s		6
THE AVIOLOGY CONCEPT PROGRAM	P. A. Becht T. Gadsden Jr.	14-18	b,c,p,m, e-s,s-s, unified sci., aviation focus		10
BALD ROCK ENVIROCAP PROJECT	J. S. Jordan	9-11	b,e-s,m s-s		9
BALTIMORE CITY-COUNTY SCIENCE SEMINARS		13-16	g-s		1
BILINGUAL CONTINUOUS PROGRESS MATHEMATICS (BCMP)	J. Perry	6-11	m	Spanish	9

*Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
BIOLOGICAL SCIENCES CURRICULUM PROJECT (BSCS)	W. V. Mayer	5-18+ TEd	b,hu n-s	Sp,Fr,It, Chin,Jap, Russian, Thai, Hebrew, Danish, Turkish, Portuguese	9,8,7,6 5,4,3,2
BIOLOGICAL SCIENCES CURRICULUM STUDY ELEMENTARY SCHOOL SCIENCE PROJECT (BSCS-ESSP)	R. R. Tolman	5-11	b,c,p,m, e-s,s-s, h,l-a, art		9
BIOLOGICAL SCIENCES CURRICULUM STUDY (BSCS) HUMAN SCIENCES PROGRAM (HSP)	J. Robinson	11-13	b,s-s, b-s		10,9
BIOLOGICAL SCIENCES CURRICULUM STUDY: INVESTIGATING YOUR ENVIRONMENT - BSCS ENVIRONMENTAL MODULE	J. E. Anderson	14-17	b,c,s-s		9
BIOLOGICAL SCIENCES CURRICULUM STUDY - ME AND MY ENVIRONMENT (MAME), A BSCS LIFE SCIENCE SPECIAL PROGRAM	W. V. Mayer	13-18	e-e,e-s, b,c,p		10,9
BIOLOGICAL SCIENCES CURRICULUM STUDY -- ME IN THE FUTURE	W. V. Mayer	15-17	b,c,p e-s		10
BIOLOGICAL SCIENCES CURRICULUM STUDY - ME NOW (ME NOW) (LIFE SCIENCES: A BSCS SPECIAL EDUCATION PROGRAM)	W. V. Mayer	10-14	b		10,9
BIOLOGICAL SCIENCES CURRICULUM STUDY - MINICOURSE DEVELOPMENT PROJECT	W. V. Mayer	18-20	b		9
BIOLOGY, PHASE ACHIEVEMENT SYSTEM (PAS) (See: Phase Achievement System)	C.D. Jorgensen	18+	b		8
BIOMEDICAL INTERDISCIPLINARY CURRICULUM PROJECT (BICP)	L. Hughes	16-18	b,c,p,m, med, s-s t, c-s		10,9
BI-STATE PROJECT FOR THE IMPROVEMENT OF IN-SERVICE TEACHER EDUCATION THROUGH SCIENCE	J. R. Shinpoch	TEd	s		9,8,7

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
BOSTON COLLEGE MATHEMATICS INSTITUTE (BCMI)	S. Bezuska	5-19 TEd	m		9,8,7,6 5,4,3,2
BROAD SPECTRUM ENVIRONMENTAL EDUCATION PROJECT	M. Ebersbach C. Bemiss	5-18	e-e		10,9
BUILDING EDUCATIONAL BRIDGES BETWEEN SCIENCE AND THE HUMANITIES	V.L. Parsegian	19-20	b,c,p,r, s-s,art		9,8
CALANDRA'S PHYSICAL SCIENCE AND MATHEMATICS PROJECT, GRADES 2-9	A. Calandra	7-14	p,c,m, p-s		2
CALCULATORS IN A GENERAL MATH LABORATORY (See: Drop In Mathematics and: Calculators in General Math)	G. Catterton	14	m		7,6
CALCULATORS IN GENERAL MATH (See: Calculators in a General Math Laboratory and: Drop in Mathematics)	G. Catterton	14	m		9
CALCULUS BASED PHYSICS MODULES	R. G. Fuller	18+	p		10
CALIFORNIA MATHEMATICS IMPROVEMENT PROGRAMS, SPECIALIZED TEACHER PROJECT	B. B. Frank	7-12	m		8,7,6
CAMBRIDGE CONFERENCE ON SCHOOL MATHEMATICS (CCSM)	J. Joanou H. P. Bradley	6-18	m		8,7,6,5
CAREER ORIENTED PRE-TECHNICAL PHYSICS (COPP)	J. M. Harris	15-17	p		10
CATALOGING IDAHO'S NATURAL RESOURCES	D. L. Parsons	6-18	g		6
CEMREL, INC. COMPREHENSIVE SCHOOL MATHEMTICS PROGRAM - ELEMENTARY COMPONENT (See: Comprehensive School Mathematics Program)	B. Kaufman	6-12	m		9
CEMREL, INC. COMPREHENSIVE SCHOOL MATHEMATICS PROGRAM - ELEMENTS OF MATHEMATICS (CSMP-EM) (See: Comprehensive School Mathematics Program)	B. Kaufman	12-18	m		9

*Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
CENTER FOR ENVIRONMENTAL EDUCATION, MINNESOTA ENVIRONMENTAL SCIENCES FOUNDATION, INCORPORATED (MESFI) (See: Minnesota Environmental Sciences Foundation, Inc. MESFI)	R. E. Collins	5-18	e-e		8,7
CENTER FOR RESEARCH IN COLLEGE INSTRUCTION OF SCIENCE AND MATHEMATICS (CRICISAM)	G. Schwartz	18+	s,m		7,6,5
CENTER FOR THE DEVELOPMENT OF ENVIRONMENTAL CURRICULUM (CDEC)	D. M. Wint	7-18	e-e		9
CENTER FOR UNIFIED SCIENCE EDUCATION (See: Fuse Center for Unified Science Education)	D.V. Showalter	5-20 TEd	e-s,s-s, b,c,p		8
CENTER FOR URBAN RESEARCH IN ENVIRONMENTAL STUDIES (CURES)	T. Greer	10-17	e-s,s-s, b,c,p		9
CENTER OF COLLABORATIVE LEARNING MEDIA PACKAGES - (CLMP)	G. N. Moore	7-11	s,s-s		6
CENTRAL IOWA LOW ACHIEVER MATHEMATICS PROGRAM (CILAMP)	J. R. Williams F. W. Broadbent	12-14	m		7,6
CENTRAL MIDWESTERN REGIONAL EDUCATIONAL LABORATORY - COMPREHENSIVE SCHOOL MATHEMATICS PROGRAM (CEMREL-CSMP) (See: Comprehensive School Mathematics Program (CSMP)	B. Kaufman	6-12	m		6
CHEMICAL BOND APPROACH (CBA)	L. E. Strong	16-18	c	Sp,Jap, Portuguese	10, 9,7,6,5, 4,3,2
CHEMICAL EDUCATION MATERIAL STUDY (CHEM STUDY)	G. C. Pimentel	16-18	c	Sp,Fr,It, Jap,Chin, Germ,Russ, Hindi,Thai, Turkish, Hebrew, Icelandic, Korean, Persian, Greek, Swedish, Danish, Punjabi, Gujarati, Portuguese	9,8,7,6, 5,4,3,2

*Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
CHEMICAL ENGINEERING MODULAR INSTRUCTION (CHEMI)	E. Henly W. Heenen	18+	en-tech, ed-tech, c-s		10
CHEMICAL TECHNICIAN CURRICULUM PROJECT (CHEM TeC)	R. Pecsok	17-20	c,t		9
CHILD-STRUCTURED LEARNING IN SCIENCE (CSLS)	C. C. Matthews	5-12	g-s		7
CITIZENS AND SCIENCE EDUCATION STUDY (CASE)	W. J. Jacobson	5-adult	b,c,p el-s,m, phil,s-s		10
COLLEGE INTRODUCTORY PHYSICAL SCIENCE (CIPS)	U. Haber-Schaim	18+	p	Spanish, Portuguese	8,7
COLLEGE CURRICULUM DEVELOPMENT PROJECT: CURRICULUM RESOURCES	C. Snowden	18+	eng,m,s, s-s		6
COLLEGE SCIENCE IMPROVEMENT PROGRAM (COSIP)	D. P. Detwiler	18+	b,c,p,m, e-s		10
COMMISSION ON COLLEGE GEOGRAPHY (CCG)	J.F. Lounsbury	18+	g		8,7,6 5,4
COMMISSION ON COLLEGE PHYSICS (CCP)	J. M. Fowler	18+	p		8,7,6 5,4
COMMISSION ON EDUCATION IN AGRICULTURAL AND NATURAL RESOURCES (CEANAR) (See: Committee on Educational Policy in Agriculture)	R. E. Larson	18+	agr-e		7,6,5,4
COMMISSION ON ENGINEERING EDUCATION (CEE)	N. Hall	18+	en-s		7,6,5 4,3
COMMISSION ON THE UNDERGRADUATE PROGRAM IN MATHEMATICS (CUPM) (See: Committee on the Undergraduate Program in Mathematics)	L. Durst	18+	m		5
COMMISSION ON UNDERGRADUATE EDUCATION IN THE BIOLOGICAL SCIENCES (CUEBS)	E. Hanson M. Schein	18+	b		7,6,5 4,3
COMMITTEE ON EDUCATIONAL POLICY IN AGRICULTURE (CEPA) (See: Commission on Education in Agriculture and Natural Resources)	A. E. Darlow	18+	agr-e		3

*Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
COMMITTEE ON LOW ACHIEVERS IN MATH - DENVER AREA (COLAMDA) (See: Personalized Instruction Center)	T. Shoemaker	12-18	m		9,7
COMMITTEE ON THE UNDERGRADUATE PROGRAM IN MATHEMATICS (CUPM) (See: Commission on the Undergraduate Program in Mathematics)	B. Rhoades D. Bushaw	18+	m		9,8,7,6 4,3
COMMUNITY EDUCATIONAL RESOURCES PROJECT	R. L. Hunt J. K. Gessel	5-adult	s,m		8,2
COMMUNITY ENVIRONMENTAL STUDY PROGRAM (CESP)	E. Hessler	5-17	eng,s-s, b,h-e		9
COMMUNITY LEADERS TRAINING IN ENVIRONMENTAL STUDIES	R. Allen	adult	e-s,s-s, b		10
COMPREHENSIVE SCHOOL MATHEMATICS PROGRAM (CSMP) (See: Southern Illinois University Comprehensive School Mathematics Program and: Central Midwestern Regional Educational Laboratory - Comprehensive School Mathematics Program and: Cemrel, Inc. Comprehensive School Mathematics Program - Elementary Component and: Cemrel, Inc. Comprehensive School Mathematics Program - Elements of Mathematics	B. Kaufman	6-18	m		10,8,7
COMPUTER AIDS FOR CHEMICAL ENGINEERING EDUCATION (CACHE)	W. D. Seider	18+	en-s		8
COMPUTER ASSISTED INSTRUCTION LABORATORY IN MATHEMATICS AND SCIENCE (CAI)	T. A. Hartley F. O'Neal	11-13	c,p,m, e-s		9,8,7,6
COMPUTER ASSISTED INSTRUCTION PROGRAM - ARITHMETIC PROFICIENCY PROGRAM	T. S. David	10-12 adult	m		8
COMPUTER - BASED EDUCATION	J.J. Allen III	18+	t,s-s		9
COMPUTER-BASED MATHEMATICS INSTRUCTION AT THE STANFORD-BASED LAB FOR LEARNING AND TEACHING (CBMI)	P. Suppes	6-13	m		7,6,5 4,3

*Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
COMPUTER INTEGRATION IN THE MATHEMATICS CLASSROOM	R. Barry	15-18	m		10
COMPUTER KNOWLEDGE - PROJECT DELTA	T. Green	12-18	c-s		8
COMPUTER ORIENTED EXPERIMENT IN SCIENCE TEACHING (COEXIST)	D. Krieder	18+	en-s, m,p		8,7
COMPUTER ORIENTED MATERIALS PRODUCTION FOR UNDERGRADUATE TEACHING (COMPUTe)	A.W. Luehrmann	18+	b,c,p,m, e-s,s-s, t,g,u-s, ec		9,8
CONCEPTS AND APPLICATIONS OF MATHEMATICS PROJECT (CAMP)	P. Rosenbloom	10-14	m		5
CONCEPTUAL SCHEMES IN SCIENCE: A BASIS FOR CURRICULUM DEVELOPMENT	A. F. Eiss	5-18	s		7,6,5
CONCEPTUALLY ORIENTED PROGRAM IN ELEMENTARY SCIENCE (COPES)	M. H. Shamos	5-12	b,c,p, e-s		9,8,7,6, 5,4
CONSERVATION AND ENVIRONMENTAL STUDIES CENTER, INC. (CESC, INC.)	V. E. Vivian	5-adult	e-s		10
CONSERVATION CURRICULUM IMPROVEMENT PROJECT (CCIP)	A.H.H. Dorsey	6-18	b,c,p, e-s,s-s, h-e		9,8,7, 6,5
CONTINUOUS CURRICULUM DEVELOPMENT - RURAL SCHOOL	J. Andrews	5-18	s		7
CONTINUOUS PROGRESS MATHEMATICS PROGRAM FOR PRIMARY MIGRANT SPANISH-SPEAKING MEXICAN AMERICAN CHILDREN	E. Bernal, Jr.	5-12	m	Spanish	8
CONTINUUM STUDIES IN SCIENCE EDUCATION FROM KINDERGARTEN THROUGH COLLEGE	A. Eiss	5-18+	s		1
COOPERATIVE CURRICULUM IMPROVEMENT PROGRAM - BIOLOGY (BioCo-TIE)	J. P. Jordan	18+	b	Spanish	9,8
COOPERATIVE ENVIRONMENTAL EDUCATION PROJECT (CEEP)	L. R. Liggett	12	e-e		9
COOPERATIVE GENERAL SCIENCE	O. P. Puri	18+	b,c,p,m, e-s	Spanish Phillipino	9,8,7

*Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
COORDINATED ARTICULATED SCIENCE PROGRAM OF ESCAMBIA COUNTY SCHOOLS (CASP)	W. D. Thomas	5-18	s		8
CORE - COURSE FOR COLLEGE SCIENCE MAJORS CONTAINING PHYSICS, CHEMISTRY AND BIOLOGY (See: Development of a Core Course for College Science Majors Combining Materials from Introductory Courses in Biology, Chemistry and Physics-Phase III)	A. D. Pickar	18+	b,c,p		9
COUNCIL ON EDUCATION IN THE GEOLOGICAL SCIENCES (CEGS)	J. Harbaugh F.D. Holland	18+	geol		8,7,6, 5,4
COURSE DEVELOPMENT PROJECT IN QUANTITATIVE PHYSICAL SCIENCE (QPS) (See: Development of a Ninth Grade Course in Quantitative Physical Science)	S. Githens	14-18	p-s		6
CREATIVE LABORATORY SCIENCE PROGRAM FOR JUNIOR HIGH SCHOOLS	E. W. Semel	12-14	s,integ		4
CRYSTAL LAKE OUTDOOR EDUCATION PROGRAM	N. Ziemer	5-18	b,c,p,m, e-s,s-s, p-e,l-a, art,mus, t	French	9
CURRICULUM AND TEXTBOOK PROJECT (AFGHANISTAN)	R. Whittemore	7-12	m	Pashto Dari	9,8
CURRICULUM DEVELOPMENT OF TEACHING GUIDES FOR SCIENCE	E. F. Carlson	6-18	g-s		5,4,3,2
CURRICULUM MODIFICATION THROUGH ENVIRONMENTAL STUDIES	J. Jarrett	5-13	e-e		10
CUYAHOGA HERITAGE PROJECT, NORTHEAST OHIO (See: Watershed Heritage Project)	J. Chadbourne	13-20	e-e		9
DARTMOUTH SECONDARY SCHOOL COMPUTER PROJECT (See: Demonstration and Experimentation in Computer Training in Use in Secondary Schools)	T. E. Kurtz	12-17	b,c,p,m, e-s,s-s, comm,t		9

*Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
DEMONSTRATION AND EXPERIMENTATION IN COMPUTER TRAINING IN USE IN SECONDARY SCHOOLS (See: Dartmouth Secondary School Computer Project)	T. E. Kurtz	12-17	m,c-s		7,6
DEMONSTRATION OF AN IMPROVED SCIENCE PROGRAM FOR UNDER-ACHIEVING STUDENTS (DISCUS)	R. Cronin	13-15	b,c,p, e-s		9,8,7
DEMONSTRATION OF THE ROLE OF SCIENCE IN THE PROGRAMS OF EDUCATIONALLY DEPRIVED CHILDREN IN GRADES 7-9 (S.E.L. PILOT PROJECT) (See: Demonstration of an Improved Science Program for Underachieving Students (DISCUS)	N. E. Bingham	13-15	b,c,p, e-s		6
DESIGNS FOR SCIENCE FACILITIES	R. Clark	12-18	s		8
DESOTO ENVIRONMENTAL LEARNING LABORATORY (ELL)	W. Stanko	11-13	b,e-s, ecol		9
DEVELOPING MATHEMATICAL PROCESSES (DMP) (See: Wisconsin Mathematics Curriculum Publications)	T. A. Romberg	5-11	m	Spanish	10,9
DEVELOPMENT AND IMPLEMENTATION OF A FOUR-YEAR, UNIFIED, CONCEPT CENTERED SCIENCE CURRICULUM FOR SECONDARY SCHOOLS (See: Monona Grove, K-12, Unified Concept Science Program)	C.H. Pfeiffer	5-18	e-s,s-s, b,c,p		8,7
DEVELOPMENT OF A CORE-COURSE FOR COLLEGE SCIENCE MAJORS COMBINING MATERIAL FROM INTRODUCTORY COURSES IN BIOLOGY, CHEMISTRY AND PHYSICS-PHASE III	A. D. Pickar	adult	b,c,p		6
DEVELOPMENT OF AN INFORMATION SYSTEM FOR MATHEMATICS CURRICULUM MATERIALS AND RESEARCH STUDIES: K-6	D. E. Creswell E. Berger	5-12	m		4
DEVELOPMENT OF A NINTH GRADE COURSE IN QUANTITATIVE PHYSICAL SCIENCE (See: Quantitative Physical Science and: Course Development Project in Quantitative Physical Science)	S. Githens	14-18 adult	p-s		2

*Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
DEVELOPMENT OF A SELF-STUDY PHYSICS PROGRAM IN A MULTI-DISCIPLINARY BASIC COURSE FOR SCIENCE MAJORS	P. Pennington	adult	p		9,7
DEVELOPMENT OF A ZOOMOBILE WILDLIFE TEACHING LABORATORY	S. Sitkoff G. Garner	5-13	b	Spanish	9
DEVELOPMENT OF COMPETENCY BASED MODULAR EXPERIMENTS IN POLYMER SCIENCE AND TECHNOLOGY (MOD)	E. M. Pearce	18+	c,mat		10
DEVELOPMENT OF MATERIALS FOR THE TRAINING OF SCIENCE EDUCATION PERSONNEL IN EDUCATIONAL TECHNOLOGY	H. A. Smith	TEd	s		7
DEVELOPMENT OF SELF-INSTRUCTIONAL UNITS FOR A CORE PROGRAM IN BIOLOGY	S. Postlethwait	adult	b		8
DROP IN MATHEMATICS (See: Calculators in a General Math Laboratory and: Calculators in General Math)	G. Catterton	14	m		5
EARTH AND SPACE SCIENCE IMPROVEMENT PROJECT (See: Pennsylvania Earth and Space Science Improvement Program)	W. H. Bolles	13-18	e-s		9,8
EARTH SCIENCE CURRICULUM PROJECT (ESCP) (See: Earth Science Project and: Earth Science Education Project)	W. H. Matthews	13-18	e-s	Sp,It,Jap, Turkish, Portuguese, Korean, Arabic	9,8,7,6, 5,4,3,2
EARTH SCIENCE EDUCATION PROJECT (ESSP) (See: Earth Science Teacher Preparation Project and: Earth Science Curriculum Project and: Environmental Studies Project)	R. Heller W. Matthews	5-18 TEd	e-s		8
EARTH SCIENCE PROJECT	R. Heller	7-12	e-s		1
EARTH SCIENCE TEACHER IN-SERVICE PROGRAM	F. L. Beyer	TEd	e-s		9
EARTH SCIENCE TEACHER PREPARATION PROJECT (ESTPP) (of the Earth Science Education Project)	J.F. Thompson	TEd	e-s		9,8

*Language translations

Project Title (Acronym)	Director/ Initiator	Age	Subject	Language*	ICH Reports
EAST HIGH SCHOOL APPLIED MATHEMATICS LABORATORY	L. Lewis	14-18	m		8
ECO-CURRICULUM DEVELOPMENT AND LEARNING LABORATORY	M.R. Larson	5-20	b,c.p, e-e,e-s s-s		9
ECOLOGUE/CAMBRIDGEPORT	P.B. Herr	14 - adult	e-e		8
ECOLOGY CENTER OF ANN ARBOR	M. Schechman	adult	e-e		8
EDUCATION AND EXPERIENCE IN ENGINEERING (E^3)	T.P. Torda	18+	c,p,m,t, s-s,en-s		10
EDUCATIONAL MODULES FOR MATERIALS SCIENCE AND ENGINEERING (EMMSE)	R. Roy	18+	mat-s, en-s		10
EDUCATIONAL RESEARCH COUNCIL OF AMERICA MATHEMATICS PROGRAM (ERCMP)	J.F. Mehegan	5-12	m		10,9,8
EDUCATIONAL RESEARCH COUNCIL (ERC) UNIFIED SCIENCE PROGRAM (See: ERC Science Program)	G.D. Day	13-20	b,c,p, e-s,m, t,s-s, psych,hu		10,9
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)	R. Howe C. Hoover	TEd	b,c,p,m, e-s,s-s,t		9,5
EFFECTS OF MODERN AND CONVENTIONAL MATHEMATICS CURRICULA ON PUPIL ATTITUDES, INTERESTS AND PERCEPTION OF PROFICIENCY	J.J. Ryan	14	m		4
EKISTICS, A GUIDE FOR THE DEVELOPMENT OF AN INTER-DISCIPLINARY ENVIRONMENTAL EDUCATION CURRICULUM	R.J. Schafer	5-18	e-e		9
ELEMENTARY CURRICULUM MATERIALS PROJECT (ECMP)	R.C. Youngs	6-9	p-s		8,7,6
ELEMENTARY-JUNIOR HIGH SCIENCE PROGRAM	F.G. Usilton	6-14	s		1
ELEMENTARY MATHEMATICS CONCEPTS WITH CALCULATORS (EMC^2)	J.D. Miller A. Kessener	5-11	m		10
ELEMENTARY SCHOOL SCIENCE PLANNING PROJECT	L. Riesser	6-12	e-e		4
ELEMENATRY SCHOOL SCIENCE PROJECT	S.P. Diliberto	7-13	b,c,p,m		9,1

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
ELEMENTARY SCHOOL SCIENCE PROJECT (ESSP)	J. M. Atkin	10-14	astr		7,6,5
ELEMENTARY SCHOOL SCIENCE PROJECT (ESSP-USU)	W. Saunders J. Wood	6-7	b,c,p		9,8,7,6, 5,4,3,2
ELEMENTARY SCIENCE	A. Helwig	6-12	s		1
ELEMENTARY SCIENCE	J. Wickless	6-12	s		1
ELEMENTARY SCIENCE ADVISORY AND RESEARCH PROJECT	D. Hawkins	6-12	s		5
ELEMENTARY SCIENCE ADVISORY CENTER	J.P. Richtmyer				6
ELEMENTARY SCIENCE CURRICULUM	E.V. Siemasko	6-12	s		4
ELEMENTARY SCIENCE PROJECT	J. C. Paige	5-12	s		5,4,3
ELEMENTARY SCIENCE PROJECT (See: Vermont: Elementary Science Project)	B. Ragle	6-12	s		6
ELEMENTARY SCIENCE STUDY (ESS)	D. Hawkins A. Naiman	2-14	b,c,p,m, e-s,mus	French, Spanish, Hindi	9,8,7,6, 5,4,3, 2,1
ELEMENTARY SCIENCE TEACHER TRAINING (ESTT) (See: Humanistic Approach to Natural Science)	J. V. Conner	18-20 TEd	b,c,p, e-s,hu	Spanish	10,9,8
ENGINEERING CONCEPTS CURRICULUM PROJECT - MAN AND HIS TECHNOLOGY (ECCP-MHT)	E. J. Piel J. B. Truxal	18-20 TEd	b,m,t, s-s		9
ENGINEERING CONCEPTS CURRICULUM PROJECT - THE MAN MADE WORLD (ECCP-TMMW)	J. B. Truxal E. J. Piel E. E. David	15-18 adult TEd	b,p,m, t,s-s	Japanese, Korean	9,7,6, 5,4
ENGINEERING CONCEPTS CURRICULUM PROJECT - TECHNOLOGY-PEOPLE-ENVIRONMENT	E. J. Piel J. B. Truxal	12-16	b,c,p,m, e-s,s-s, t		9
ENVIRONMENTAL CENTER FOR OUR SCHOOLS	C. A. Phaneuf	8-12 TEd	e-e		9
ENVIRONMENTAL EDUCATION	J. M. Major	10-17	b,c,p,m, e-s,s-s, e-e,t		9
ENVIRONMENTAL EDUCATION	C. Palmer	5-18+	b,c,m, e-s,s-s, en-t,l-a, ed-t,art		10

*Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
ENVIRONMENTAL EDUCATION BIBLIOGRAPHY DISSEMINATION (See: Environmental Education Statewide Evaluation and Dissemination)	J. F. Howell	5-18+	e-s,s-s, b,c		new title (1976)
ENVIRONMENTAL EDUCATION COMMUNITY OPPORTUNITY FOR STEWARDSHIP (ECOS)	F. Thompson	5-18 TEd	b,c,p,m, e-s,s-s, e-e	French	9
ENVIRONMENTAL EDUCATION CURRICULUM DEVELOPMENT PROGRAM	I. Inman	5-18	e-s,s-s, b,c,p		9
ENVIRONMENTAL EDUCATION CURRICULUM DEVELOPMENT PROJECT (See: Student Assisted Development of Materials)	K. B. Wiley	5-18	s-s,e-e		8
ENVIRONMENTAL EDUCATION DEMONSTRATION PROJECT	C. S. Kellogg D. French	6-18 TEd	e-e		9
ENVIRONMENTAL EDUCATION PROGRAM	M. Meissen	5-18	e-e		8
ENVIRONMENTAL EDUCATION SERVICE CENTER (EESC)	L. Scheafer	5-adult	e-e		10
ENVIRONMENTAL EDUCATION STATEWIDE EVALUATION AND DISSEMINATION (See: Environmental Education Bibliography Dissemination)	J. F. Howell	5-adult	e-e		8
ENVIRONMENTAL EXPERIMENTS PROGRAM (EEP)	C. S. Randall	14-adult	e-e		8
THE ENVIRONMENTAL IMPACT OF ELECTRICAL POWER GENERATION: NUCLEAR AND FOSSIL--A MINICOURSE	J.J. McDermott	13-18 adult TEd	e-e,s-s, ed-t,ec, b,c,p		9,8
ENVIRONMENTAL INFORMATION PACKETS	J. Musumeci	9-14	e-e		9
ENVIRONMENTAL PLANNING WORKSHOP FOR COMMUNITY LEADERS	T. Andrews	adult	e-p		9
ENVIRONMENTAL SCIENCE CENTER	R. Myshak	5-18 TEd	b,ecol		6
ENVIRONMENTAL SCIENCE CONCEPTS AND PROCESSES--ENQUIRY (ESCAPE)	W. Peruzzi	12-13	e-e,s		10
ENVIRONMENTAL SCIENCE STUDY CURRICULUM (ESSC)	W. Allen	12-15	e-e		9

*Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
ENVIRONMENTAL STUDIES INSTITUTE	J. Monwaring	5-adult	e-e		8,7
ENVIRONMENTAL STUDIES PROGRAM	G. MacDonald W. A. Reiners	adult	e-e,s-s b,t		9,8
ENVIRONMENTAL STUDIES PROJECT (ES) (of the Earth Science Education Program) (See: Essentia: Environmental Studies)	R. Samples	adult 5-18	e-e		8
ERC Science Program (See: Educational Research Council Unified Science Program and: Life Science Investigations - Man and the Environment	T. F. Andrews G. Day	13-20	b,p,c,m, e-s,s-s, integ		8,7,6
ESSENTIA: ENVIRONMENTAL STUDIES (ES) (See: Environmental Studies Project)	R. E. Samples	5-18 TEd adult	b,c,p,m, e-s,s-s, hu,art, t,l-a		9
ESTABLISHMENT OF A MODEL REGIONAL COMPUTER CENTER USING TIME SHARING	T. Kurtz	18+	c-s		7
THE ETHICS OF ENVIRONMENTAL CONCERN: RATIONALE AND PROTOTYPE MATERIALS FOR ENVIRONMENTAL EDUCATION WITHIN THE HUMANISTIC TRADITION	R. F. Allen	14-18	e-e,s-s, ethics		8
ETHNO-SCIENCE	C. Hime	14-18	b,e-s, an,e-e	Navajo	9
EVALUATION OF SECONDARY MATHEMATICS CURRICULA	P.C. Rosenbloom J. J. Ryan	12-18	m		4
EVALUATION OF THE IMPLEMENTATION OF NEW SCIENCE CURRICULA AND COURSE IMPROVEMENT MATERIALS	S.M. Obradovic	TEd	s		6
EXPERIENCE IN OUTDOOR EDUCATION (EOE)	A.J. Boyer	5-12	b,e-s,m, s-s,l-a, Eng,sur		9
EXPERIMENTAL INTERDISCIPLINARY INTRODUCTORY SCIENCE	G.G. Evans	18+	s,p,c,b		6
EXPERIMENTAL PROJECT IN GENERAL MATHEMATICS	A.W. Goodwin	14+	m		4

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
EXPLORATIONS IN BIOLOGY (EIB)	P.G. Koutnik E. M. Koos	14-17	b	Hebrew	9,8
EXPLORING HUMAN NATURE (EHN)	A. Gil	16-18	s-s,b		9
EXPLORING NUMBER CONCEPTS (ENC)	R. Randall	5-6	m		9
FEDERATION FOR UNIFIED SCIENCE EDUCATION (FUSE) (See: FUSE Center for Unified Science Education)	V. Showalter	5-17 adult	unified science		10
FIELD TEST OF "NEW" CURRICULAR MATERIALS IN ELEMENTARY SCHOOL SCIENCE IN THE PUBLIC SCHOOLS OF NEW YORK CITY	M. Giddings	6-12	s		6
A FIRST STEP TOWARDS THE IMPLEMENTATION OF THE CAMBRIDGE MATHEMATICS CURRICULUM IN A K-12 UNGRADED SCHOOL	G.R. Foster B.A. Kaufman	6-18	m		4
FLINT HILLS ELEMENTARY SCIENCE PROGRAM DEVELOPMENT PROJECT	G. L. Abegg	11-14	s		6,5
FLINT INTRODUCTORY PHYSICS SEQUENCE CURRICULUM PROJECT (FLIPS)	D.E. DeGraaf	18+	p		8
FLORIDA STATE UNIVERSITY JUNIOR HIGH SCHOOL SCIENCE CURRICULUM WRITING PROJECT	E. Burkman	12-14	s		4
FOUNDATIONAL APPROACHES IN SCIENCE TEACHING (FAST)	E.M. Pottenger	12-17	b,c,p, e-s, t,s-s	Lao	10,9,8,7
FREDERICK COUNTY QUALITY IMPROVEMENT PROGRAM FOR MATHEMATICS	L. Weagley	10	m		6
FUSE CENTER FOR UNIFIED SCIENCE EDUCATION (See: Federation for Unified Science Education See also: Center for Unified Science Education)	V.M. Showalter	5-20	b,c,p, e-s,s-s		9

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
FUTURE-ORIENTED CURRICULUM - UNION SCHOOLS (FOCUS)	P.A. Jennings	5-12	all		6
GENERAL BIOLOGY-AUDIO-TUTORIAL INDEPENDENT STUDY	C. W. Gaddis	18+	b		8
1965-1966 GENERAL MATHEMATICS I AND II WRITING PROJECT	G.W. Hudson	14-18	m		7,6,5
GENERAL MATHEMATICS WRITING PROJECT OF THE NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS		14	m		5
GEOGRAPHY CURRICULUM PROJECT	M.J. Rice	5-12	g		10,9, 8,7,
GEOGRAPHY IN LIBERAL EDUCATION PROJECT (GLEP)	J.F. Lounsbury	18+	g		3
GEOLOGICAL EDUCATION ORIENTATION STUDY (GEO-STUDY)	O.T. Hayward	18+	geol		3
GEOLOGY RESOURCE UNIT	E.M. Palmer	12	geol		4
GEOMETRY COURSE FOR PROSPECTIVE HIGH SCHOOL TEACHERS	S. Schuster	18+ TEd	m		4
GRAND RAPIDS MATHEMATICS LABORATORY PROJECT	L.G. Woodby	TEd	m		9,6
GREATER CLEVELAND MATHEMATICS PROGRAM OF THE EDUCATIONAL RESEARCH COUNCIL OF AMERICA (ERCMP) (See: The Educational Research Council of America Mathematics Program (ERCMP))	J.F. Mehegan G. Cunningham	5-12	m		7,6,5,2
GROUP AGAINST SMOG AND POLLUTION (GASP)	A. S. Kitzes	14-18	e-e		8
GUIDED DESIGN: A NEW CONCEPT IN COURSE DESIGN AND OPERATION	C. E. Wales	15+	en, e-s,t		8
THE GUIDED DESIGN SYSTEMS APPROACH-ENVIRONMENTAL EDUCATION	C. E. Wales	15-18	e-e		9
GUIDED ENGINEERING DESIGN	C. E. Wales	17-18	t		9

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Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
HARVARD PROJECT PHYSICS (See: Project Physics)	F.J. Rutherford F. Watson	17-18	p		7,6,5, 4,3,
HAWAII MARINE STUDIES SCIENCE (HMSS)	F.M. Pottenger	15-17	b,c,p, ocean, earth, en-t		10
HAWAII MARINE STUDIES SOCIAL SCIENCE (HMSoSi)	R. Mitchell	15-17	s-s		10
HAWAII METRIC PROJECT (See: Metrics-The Hawaii Metric Program)	I. King	5-10	m		10
HAWAII NATURE STUDY PROJECT	Sister Edna Demanche	5-12	e-e		10
HEALTH ACTIVITIES PROJECT (HAP)	Watson M. Laetsch	10-13	h		10
HIGH SCHOOL FOR ONE	C. Hausken	13-18	p-s,m		6
HIGH SCHOOL GEOGRAPHY PROJECT: GEOGRAPHY IN AN URBAN AGE (HSGP)	N. Helburn S. Natoli	11,17	g,s-s		9,8,7, 6,5,4
HIGH SCHOOL POLITICAL SCIENCE CURRICULUM PROJECT. PRODUCT: COMPARING POLITICAL EXPERIENCES (CPE)	J. Gillespie H. Mehlinger J. Patrick	17-18	s-s		10,9
HISTORY OF PHYSICS LABORATORY	S. Devons	16-17 18+	p		10
HUMAN ANATOMY AND PHYSIOLOGY: AN AUDIO-TUTORIAL APPROACH	W.J. McCauley	18+	b,p,h-e, anatomy		8
HUMAN BEHAVIOR CURRICULUM PROJECT FOR SECONDARY SCHOOLS (HBCP)	John K. Bare	16-18	b-s		10
HUMANISTIC APPROACH TO NATURAL SCIENCE (HANS) (See: Elementary Science Teacher Training)	J.V. Connor	18-20 TEd	b,c,p, hu,e-s		10,9,8
HUNTINGTON TWO	Ludwig Braun	12-20	b,p,s-s		9
IDAHO EARTH SCIENCE SERIES PUBLICATIONS	Lewis Prater		c-s, geol		7,6

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
IDEA-CENTERED LABORATORY SCIENCE (I-CLS) (See: Michigan Science Curriculum Committee Junior High School Project)	W. VanDeventer	12-14	b,c,p, e-s integ	Sp,Jap, Germ,Fr, Swedish	9,8,7
IDEAS AND INVESTIGATIONS PROJECT (IIS)	H.K. Wong	14-18	p,b,g-s		8,7
IDENTIFYING BEHAVIORAL OBJECTIVES FOR SCIENTIFIC LITERACY	A.F. Eiss		s		7,6
ILLINOIS INSTITUTE OF TECHNOLOGY, SECONDARY SCHOOL COMPUTER SCIENCE EDUCATION (SSCSE) OPERATION COMPU/TEL.	C. R. Bauer A. P. Peluso	6-adult	c-s		6,5
IMPLEMENTATION OF THE NEW JERSEY STATE MASTER PLAN FOR ENVIRONMENTAL EDUCATION	E.J. Ambry	5-20	b,c,p,m, e-e,s-s, e-s,art,t		9
IMPLEMENTING AUTO-TUTORIAL BIOLOGY IN SECONDARY SCHOOLS (See: Audio-Tutorial Biology in the Secondary School)	K.H. Bush	13-14	b		7
IMPROVEMENT OF SCIENCE INSTRUCTION IN OKLAHOMA,K-12	F.R. Barn	5-18	s		1
INDEPENDENCE OUTDOOR LABORATORY	C.T. Vizzini	5-18	b,e-s,s-s		9,8
INDIVIDUAL LECTURES FILM PROJECT OF THE MATHEMATICAL ASSOCIATION OF AMERICA	R. C. Long	18+	m		7
INDIVIDUALIZED CHEMISTRY (IC)	P.A. Brecht	15-20	c		9
INDIVIDUALIZED INSTRUCTION IN ELEMENTARY ALGEBRA VIA CASSETTES (See: Individualized Instruction in Mathematics)	M.L. Edwards	12-17	m		8
INDIVIDUALIZED INSTRUCTION IN MATHEMATICS (See: Individualized Instruction in Elementary Algebra Via Cassettes)	M.L. Edwards	13-18	m		10
INDIVIDUALIZED SCIENCE (IS) (See: Individually Prescribed Instruction in Science)	A.B. Champagne L.E. Klopfer	5-14	b,c,p		10,9,8,
INDIVIDUALIZED SCIENCE INSTRUCTIONAL SYSTEM (ISIS)	E. Burkman	14-18	b,c,p, e-s		10,9

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INDIVIDUALIZED SCIENCE INVESTIGATIONS (ISI)	G. Day D.G. Pegler	15-20 TEd	b,c,p, e-s, psyc		9
INDIVIDUALIZING INSTRUCTION IN COLLFGE BIOLOGY	E.B. Kurtz	18+	b		7
INDIVIDUALIZED PRESCRIBED INSTRUCTION IN SCIENCE (IPI SCIENCE) (See: Individualized Science)	L.E. Klopfer	5-15	b,c,p, e-s		7
INDIVIDUALLY PRESCRIBED MATHEMATICS INSTRUCTION (IPI MATH)	R. Glasser J. Bolvin	6-12	m		5
INNER-CITY TEACHERS OF SCIENCE (ICTOS)	W.E. Massey	TEd	b,c,p,m		9
INQUIRY DEVELOPMENT IN BIOLOGICAL SCIENCES CURRICULUM STUDY	W.G. Jones	14-18	b		6
INQUIRY OBJECTIVES IN THE TEACHING OF BIOLOGY	R.M. Bingman	14-18 TEd	b		7
INQUIRY ROLE APPROACH (IRA)	R.M. Bingman	14-15	b		9,8,7
INSTRUCTIONAL SYSTEMS APPROACH TO PHYSICAL AND EARTH SCIENCES	R.A. Bair	14-18	p-s e-s		6
INTEGRATED SCIENCE APPROACH (ISA)	G. Merson	15-16	b,c,p		9
AN INTEGRATED SCIENCE PROGRAM FOR PRE-SERVICE ELFMENTARY SCHOOL TEACHERS	A. Devito F. Nordland	18+ TEd	b,c,p, e-s, meth		9
INTEGRATED SEQUENCE FOR HIGH SCHOOL MATHEMATICS	F. Paul	13-17	m		10
INTENSIVE MODULAR SHORT COURSES IN CHEMISTRY	R.A. Oysteryoung R.K. Skogerboe	18+	c		10
INTERDISCIPLINARY APPROACHES TO CHEMISTRY (IAC)	H. Heikkinen M. Gardner	16-18	c		9,8
INTERDISCIPLINARY ENVIRONMENTAL EDUCATION K-12 (IEE)	J. Arena	5-17	e-e		8
INTERMEDIATE SCIENCE CURRICULUM STUDY (ISCS)	E. Burkman G. Dawson	12-15	b,c,p, e-s	Fr,Sp, Jap	9,8,7,6,5

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INTERRELATED EXPLORATIONS IN SCIENCE (IES)	N.C. Griffin	11-13	b,c,p, e-s		10,9
INTERRELATED MATHEMATICS SCIENCE PROJECT (IMS)	J.E. Arena	14-18	s,m, integ		8,7
INTRODUCTORY CHEMISTRY AND PHYSICS: A COMBINED FIRST YEAR COURSE FOR SCIENCE MAJORS	R. Hoyt	18+	c,p		6
INTRODUCTORY PHYSICAL SCIENCE COURSE (IPS) (See: Physical Science Study Committee Introductory Physical Science and: Junior High Physical Sciences)	U. Haber-Schaim	12-14	p-s		8,7,6, 5,4,3
THE INVESTIGATIVE LABORATORY PROGRAM IN INTRODUCTORY BIOLOGY	R. Thomson	18+	b		8
IOWA SCIENCE AND CULTURE PROJECT (ISCP)	R. Yeager G.W. Cossman	17-18	s,s-s		6,5
ISSUE ORIENTED MODULES	M. Phillips	18+	p		10
JEFFERSON COUNTY CURRICULUM DEVELOPMENT (See: Jefferson County Individualized Programs)	T. Gann	6-20 TEd	b,c,p, e-s, m,s-s		9
JEFFERSON COUNTY INDIVIDUALIZED PROGRAMS	E. A. Hollis	6-18+	b,c,p, e-s, s-s,m		8
JOHN MUIR INSTITUTE URBAN EXPERIENTIAL ENVIRONMENTAL STUDIES	D. Sutton P. Hamon	12-18	e-e		9
JUNIOR HIGH ACCELERATED PROGRAM		12-14	all		1
JUNIOR HIGH SCHOOL SCIENCE CURRICULUM GUIDE	E.A. Sweatser	12-14	g-s		1
JUNIOR HIGH SCHOOL SCIENCE, GRADES 7-9	S. Schenberg	12-14	c,p,g, e-s		1
JUNIOR HIGH SCHOOL SCIENCE GUIDE (GRADES 7 AND 8)	H.I. Wagner	12 & 13	g-s		1
JUNIOR HIGH SCHOOL SCIENCE PROGRAM REVISION PROJECT	J.S. Marshall	12-14	s		1

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
JUNIOR HIGH SCHOOL SCIENCE PROJECT (See: Secondary School Science Project and: Time, Space and Matter)	F.L. Ferris J.C.G. Hall	12-14	p,c, geol		2,1
JUNIOR HIGH SCIENCE PROGRAM	R. Rizer	12-14	b,p-s, e-s		1
K-12 ENVIRONMENTAL EDUCATION PROGRAM	M.F. Meissen	5-18	e-e		9
K-12 MULTIDISCIPLINARY PROCESS CURRICULUM IN ENVIRONMENTAL EDUCATION	W.J. Hamilton	5-18	b,c,p, e-s m,t,s-s		9
K-12 SCIENCE DESIGN - LAS CRUCES SCHOOLS (K-12 SD)	J. P. Taylor	5-18 TEd	b,c,p, e-s c-e,e-e	Spanish	9,7,5, 4,3
KNOWLEDGE FOR USE PROJECT	P.R. Pennington	adult	all		9
LABORATORY EXPERIENCE FOR PROSPECTIVE ELEMENTARY SCHOOL TEACHERS	R.G. Thomson	TEd	s		8
LABORATORY EXPERIMENTS FOR CHEMISTRY COURSES	H.A. Neidig	16+	c b-e		4
LABORATORY PROGRAM FOR COMPUTER ASSISTED LEARNING (PROJECT LOCAL) (See: Project Local (Laboratory Program for Computer Assisted Learning))	R.N. Haven	8-18 TEd	b,c,p,m, e-s,s-s, b-e		9,8
LANAKILA MATHEMATICS PROJECT	I. King	5-12	m,c-e		9
LANDER CONSERVATION CENTER	J. LEGOSKI	6-18 TEd	e-e		9
LANGUAGE DEVELOPMENT/ BILINGUAL EDUCATION LEARNING SYSTEM - (ORAL LANGUAGE DEVELOPMENT, SCIENCE CONTENT)	T. Anderson	5-12	s		7
LIBERAL ARTS COMPUTER INSTRUCTION	R. Hart	18+	c-s		7
LIFE SCIENCE INVESTIGATIONS: MAN AND THE ENVIRONMENT (MATE) (See: ERC Science Program and: You and the Environment, An Investigative Approach)	G. Day D.L. Harvey	12-14	b,t,s-s e-e		9

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Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
LIGHTSHIP CHESAPEAKE, ELEMENTARY PROGRAM (LIGHTSHIP)	T.N. McFadden	12	b,c,s-s		9
LIGHTSHIP CHESAPEAKE HIGH SCHOOL STUDENTS TOWARD ENVIRONMENTAL PARTICIPATION PROGRAM (STEP)(LIGHTSHIP)	T.N. McFadden	12-18	b,c, naut-s		9
LINCOLN AREA ENVIRONMENTAL EDUCATION PROJECT (LAEEP)	D.W. McCurdy	TEd	s,s-s		9
A LONGITUDINAL STUDY OF THE EFFECTIVENESS OF CHILDREN'S EXPERIMENTATION AND LEARNING OF SELECTED PHYSICS PRINCIPLES (See: Washington: Study of Children's Learning of Physics Principles)	A.M. Lahti	6-12	p		4
LOS ANGELES SCIENCE CURRICULUM ACTIVITIES		15-18	b,phys		3
LOS ANGELES UNIFIED SCHOOL DISTRICT OUTDOOR EDUCATION	D.A. Maughan	10-12	b,e-s,		9
LOW ACHIEVERS MATERIALS PROJECT (LAMP)	D.P. McLaren	12-14	s		7
THE MADISON PROJECT	R.B. Davis	7-16	m	Japanese	10,9,8, 7,6,5,4, 3,2,1
MAINE ENVIRONMENTAL EDUCATION PROJECT	D.B. Bennett	5-20 TEd adult	e-e integ		9
MAN: A COURSE OF STUDY (MACOS)	P.B. Dow	10-12	b,t, s-s		9
MAN'S CULTURE RELATIONSHIP TO THE ENVIRONMENT-PAST, PRESENT & FUTURE	L. Livingston	8-18	b,e-s, s-s	Spanish	9
MAN AND HIS ENVIRONMENT	A.M. Hofstetter	adult	e-e		8
MARINE ECOLOGY RESEARCH PROJECT (MER) (See: Project MER)	G.J. Castellani	12-18	b,c		9
MARINE ENVIRONMENTAL STUDIES PROGRAM	D.M. Whitaker	16-18	b,m-s		10,9
MARINE SCIENCE EDUCATION CENTER (MSEC)	G.E. Mann	4-14	b,c,p, e-s		9

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
MASSACHUSETTS DEPARTMENT OF EDUCATION NASA CURRICULUM RESOURCE GUIDE (See: Massachusetts: NASA Aerospace Aerospace Resource Guide)	J.W. Packard	5-18	e-s		4
MASSACHUSETTS: NASA AEROSPACE RESOURCE GUIDE (See: Massachusetts Department of Education NASA Curriculum Resource Guide)	J.W. Packard	5-18	e-s,t		8,7,6,5
MATH IDEA KIT - SERIES I (K-3); II)(3-6)	T. Shoemaker	6-11	m		9
MATH TUTORIAL PROJECT (See: Programmed Math Tutorial Project)	D.G. Ellson N. Ronshausen	5-7	m		8
MATHEMATICS ACTIVITIES GENERATING INTEREST AND CREATIVITY (MAGIC)	L. Casagrande	14-16	m		8
MATHEMATICS COMPUTER CENTER	V.T. Gilbert	14-18	c-s		6
MATHEMATICS COURSES FOR PROSPECTIVE ELEMENTARY SCHOOL TEACHERS	J.R. Mayor	TEd	m		2
MATHEMATICS FOR CAREERS	R. Hoffman	14-20	m		9
MATHEMATICS INQUIRY IN THE CONRAD AREA (MICA)	R.R. Koch	5-13	m		9,8
MATHEMATICS LABORATORY PROJECT FOR LOW ACHIEVERS (See: Experimental Project in General Mathematics)	A.W. Goodwin	14+	m		5
MATHEMATICS-METHODS PROGRAM (MMP)	J.F. LeBlanc	19-20 TEd	m		9
MATHEMATICS/SCIENCE EDUCATION LEARNING SYSTEM	M.R. Arnett	6-13	m,s		7
MATHEMATICS SPECIALIST, PROJECT OF THE CALIFORNIA MATH IMPROVEMENT PROGRAMS	B.B. Frank	7-12	m		8,7
MAYAGUEZ CURRICULUM CENTER PRODUCTION AND TRANSLATION OF SCIENCE MATERIALS	S. Viera	5-18 TEd	g,s,c,p	Spanish	4

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
MCHS FORESTRY AND ENVIRONMENTAL EDUCATION PROJECT	H. Knapp	15-19	f,e-e		9
METRE AND LITRE ARE NEATER	R. Tardif	5-13 TEd	m		10
METRICS - THE HAWAII METRIC PROGRAM (See: Hawaii Metric Project)	I. King	5-12	m		9
MICHIGAN SCIENCE CURRICULUM COMMITTEE JUNIOR HIGH SCHOOL PROJECT (MSCC-JHSP) (See: Idea-Centered Laboratory Science)	VanDeventer	12-14	g-s		6,5,4
MILLBURN UNIFIED SCIENCE (See: Unified Science-A Three Year Approach)	L.C. Blessing	15-18	b,c,p,s, integ		8
MINNESOTA ENVIRONMENTAL SCIENCE FOUNDATION, INC. (MESFI) (See: Center for Environmental Education, Minnesota Environmental Education Foundation, Inc.)	R.J. Myshak	all	b,comm, ecol,s-s		9
MINNESOTA ENVIRONMENTAL .FIELD AND LABORATORY INVESTIGATIONS IN JUNIOR HIGH SCHOOL SCIENCES	R.E. Collins	12-14	b,e-e		6
MINNESOTA PLAN FOR ELEMENTARY AND SECONDARY ENVIRONMENTAL EDUCATION	J.C. Miller	5-18	e-e		8
MINNESOTA SCHOOL MATHEMATICS AND SCIENCE TEACHING PROJECT (MINNEMAST)	J.H. Werntz P.C. Rosenbloom	5-9 TEd	m,s		9,8,7, 6,5,4 3,2,1
MOBILE ENVIRONMENTAL EDUCATION LABORATORY (MEEL)	J. Rhoton	5-18	b,c,s-s m		9
A MODEL COMPREHENSIVE PROGRAM IN URBAN ENVIRONMENTAL EDUCATION	E. J. Hackney	4-18	e-e		9
A MODEL EDUCATION PROGRAM IN ECOLOGY, KINDERGARTEN THROUGH ADULT EDUCATION	G.R. Cary	6-18 adult	b,s-s, e-e	Spanish	9,8
MODERN COORDINATE GEOMETRY: A WESLEYAN EXPERIMENTAL CURRICULAR STUDY (See: Writing and Testing A Textbook and a Teacher's Commentary for a Tenth-year High School Course in Modern Coordinate Geometry)	R.A. Rosenbaum	14-15	m		9

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
MONONA GROVE, K-12, UNIFIED CONCEPT CENTERED SCIENCE PROGRAM (See: Development and Implementation of a Four-Year, Unified, Concept Centered Science Curriculum for Secondary Schools)	C.H. Pfeiffer	5-18	b,c,p,m, e-s,s-s		9
MOUNTAIN VIEW CENTER FOR ENVIRONMENTAL EDUCATION	D. Hawkins	5-12	e-e integ		10
MULTIMEDIA APPROACH TO SCIENCE STUDIES: STUDENT DEVELOPED RESOURCE CENTERS (MASS)	G.S. Rutter	9-12	b,c,p		10
NASA SPACE RELATED CURRICULUM SUPPLEMENTS (See: Space Resources For Teachers)	F.B. Tuttle	13-adult TEd	e-s,c, astr		8
NSTA-NASA AEROSPACE SCIENCE EDUCATION PROJECT	R. Carleton A.F. Eiss	12-14	e-s		6,5
NATIONAL ENVIRONMENTAL EDUCATION DEVELOPMENT (NEED)	V.C. Gilbert	5-18	e-e integ		8
NATIONAL TECH PHYSICS PROJECT FOR THE PRODUCTION OF SELF-INSTRUCTIONAL MODULES (See: Tech Physics Project)	P. DiLavore	18+	p,t		8
NATURAL SCIENCE CURRICULUM FOR THE NON-SCIENCE MAJOR	G.J. Demas	18+	p,b		8,7
NATURAL SCIENCE IN GENERAL EDUCATION	E.A. Arnfield	18+	p-s,b		6
NATURE OF EVIDENCE	G. D'Amour	18-20	b,c,p,s-s, geol phil		10,9
NEBRASKA BIOLOGICAL SCIENCE PROJECT	D.W. McCurdy	14-18	g		8
NEBRASKA PHYSICAL SCIENCE PROJECT (NPSP)	D.W. McCurdy	16-18	c,p		[illegible],8,7
NEW HAMPSHIRE MATHEMATICS I AND MATHEMATICS II	F.J. Prevost	14-15	m		6,5
NEW HAMPSHIRE SCIENCE PROGRAM: GRADES 7 AND 8	H.I. Wagner	12-13	b,c,p, e-s		6

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
NEW YORK STATE MATHEMATICS CURRICULUM ACTIVITIES	F. Hawthorne	5-18	m		3
NEW YORK STATE SCIENCE CURRICULUM ACTIVITIES	W. E. Young	5-14	b,c,p, e-s, s		6,3
NEW YORK YOUTH EDUCATION IN CONSERVATION	H.G. Walling	5-adult	e-e		8
NORTHWEST IOWA TELEWRITER PROJECT	A.C. Anderson	6-12	m		3
NUMBERS GAME	T.E. Rowan	7-9	m		8
OAKLEAF INDIVIDUALIZED ELEMENTARY SCHOOL SCIENCE	J. Bolvin	5-12	s		5,4
OCEANOGRAPHIC CURRICULUM FOR HIGH SCHOOLS	H.W. Dubach	14-18	c,p, m-s		6
OCEANOGRAPHIC EDUCATION CENTER (O.E.C.)	J.C. Kinney	11-13	b,e-s, m-s		6
ORANGE COUNTY SCHOOLS MARINE SCIENCE FLOATING LABORATORY "A HANDS-ON PRACTICE OF SCIENCE"	R.B. Linsky	12-18	m-s		6
OUTDOOR BIOLOGY INSTRUCTIONAL STRATEGIES (OBIS)	W.M. Laetsch	10-15	b,e-e		10,9
OUTDOOR LABORATORY	C.Y. Bonney	5-14	e-s,b		9
P. K. YONGE LABORATORY SCHOOL CORRELATED SCIENCE PROGRAM (CSP)	T. Gadsden	15-17	b,c,p, e-s		10,9
PARKWAY PROGRAM	L. Finklestein	14-18	e-e,s integ		8
PACIFIC NORTHWEST ASSOCIATION FOR COLLEGE PHYSICS (PNACP)	W.V. Johnson R. Geballe	18+	p		7,6,5
PATTERNS IN ARITHMETIC (PIA)	H. Van Engen	6-9	m		8,7,6, 5
PENNSYLVANIA CONSERVATION AND OUTDOOR EDUCATION CONTINUUM	E. Bennett	6-18 adult	e-e		6
THE PENNSYLVANIA EARTH AND SPACE SCIENCE IMPROVEMENT PROGRAM (See: Earth and Space Science Improvement Project)	W.H. Bolles	6-12	e-s		7,6,5

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
PENNSYLVANIA NUCLEAR SCIENCE PROJECT (PNS)	J.J. McDermott	15-19 TEd	nuc-s		9,8,7
PENNSYLVANIA RETRIEVAL OF INFORMATION IN MATHEMATICS EDUCATION SYSTEM (PRIMES)	E. Berger	5-14	m		8,7,5
PENNSYLVANIA SCIENCE CURRICULUM IMPROVEMENT PROGRAM	A.F. Eiss	6-adult	s		3,2
PENNSYLVANIA SCIENCE IN ACTION PROGRAM	J.E. Anthony I.T. Edgar	5-adult	s		6,5
PEOPLE AND TECHNOLOGY (P & T)	R. MacDonald	12-14	b,p,t,m, s-s		9
PERSONALIZED ADVENTURES IN CHEMICAL EDUCATION (PACE)	H.W. Wengert	15-20	c		9,8
PERSONALIZED INSTRUCTION CENTER (FORMERLY COLAMDA) (See: Committee on Low Achievers in Math - Denver Area)	T. Shoemaker	12-18	m		8
PEST POPULATION ECOLOGY, AN INTER-UNIVERSITY TRAINING PROGRAM	P.S. Messenger	18+	b		10
PHASE ACHIEVEMENT SYSTEM (PAS) (See: Biology, Phase Achievement System)	C.D. Jorgenson	adult	b		9
PHYSICAL PROCESS IN TERRESTRIAL AND AQUATIC ECOSYSTEMS	B. A. Jayne	adult	b,p,m, e-e,c-s		10
PHYSICAL SCIENCE II (PS II)	U. Haber-Schaim	12-17	c,p		8,7
PHYSICAL SCIENCE FOR NON-SCIENCE MAJORS (PSNS)	L. Bassett	19-20	c,p	Japanese, Spanish	9,8,7, 6,5
PHYSICAL SCIENCE MODULES FOR BIOSCIENCE STUDENTS	R.G. Fuller	adult	c,p		10
PHYSICAL SCIENCE STUDY COMMITTEE ADVANCED TOPICS (PSSC ADVANCED TOPICS)	U. Haber-Schaim	17-18	p		9,8,7, 6,5,4, 3,2
PHYSICAL SCIENCE STUDY COMMITTEE - COLLEGE INTRODUCTORY PHYSICAL SCIENCE (CIPS)	U. Haber-Schaim	17-18 TEd	c,p	Portuguese, Spanish	9

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
PHYSICAL SCIENCE STUDY COMMITTEE - COLLEGE PHYSICAL SCIENCE II (CPS II)	U. Haber-Schaim	17-18	c,p		9
PHYSICAL SCIENCE STUDY COMMITTEE COLLEGE PHYSICS (CPSSC)	U. Haber-Schaim	17-18	p	German, Spanish, Swed.	9,6
PHYSICAL SCIENCE STUDY COMMITTEE INTRODUCTORY PHYSICAL SCIENCE (IPS) (See: Physical Science Study Committee Junior High Sciences and: Introductory Physical Science)	U. Haber-Schaim	12-14	c,p	Fr,Sp,It, Jap,Korean, Phillipino, Portuguese, Turkish	9
PHYSICAL SCIENCE STUDY COMMITTEE (PSSC) JUNIOR HIGH SCIENCES (See: Physical Science Study Committee Introductory Physical Science (IPS) and: Introductory Physics Science)	U. Haber-Schaim	12-14	c,p		2
PHYSICAL SCIENCE STUDY COMMITTEE (PSSC) PHYSICAL SCIENCE II (PS II) (See: Physical Science II)	U. Haber-Schaim	12-17	c,p	Fr,It,Sp, Portuguese, Turkish	9
PHYSICAL SCIENCE STUDY COMMITTEE PHYSICS (PSSC)	J.R. Zacharias U. Haber-Schaim	16-17	c,p	Afrikaans, Arabic, Dutch, Finnish, French, Portuguese, Spanish, Swedish, German, Hungarian, Italian, Norwegian, Polish, Russian	9,7,6, 5,4,3, 2
PHYSICAL SCIENCE STUDY COMMITTEE - UNDERGRADUATE PROGRAM FOR PHYSICS - CHEMISTRY TEACHERS	U. Haber-Schaim	17-20 TEd	c,p,m, ed		9
PHYSICS 111X	E.B. McNeil	18+	p		10

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
PONCE CURRICULUM CENTER - PRODUCTION AND TRANSLATION OF SCIENCE AND MATHEMATICS MATERIALS	J.S. Oliver	6-18	g-s b,c	Spanish	5,4
THE PORTLAND PROJECT	V. Cheldelin M. Fiasca	14-17	b,c,p, m,s-s		9,8,7,6, 5,4,3,2
PORTLAND PROJECT - INTEGRATION OF CHEMISTRY AND PHYSICS FOR SECONDARY SCHOOLS	Karl Dittmer	14-18	c,p integ		7
PREPROFESSIONAL INDIVIDUALLY PACED INSTRUCTION (PIPI)	K.A. McCollom	19-20	c,p,m, comm		9,8
PRESUMPSCOT RIVER PROJECT FOR AWARENESS OF THE REGIONAL ENVIRONMENT(PREPARE)	D.B. Bennett	15-18	e-e b,c,p		10
PRIMARY ENVIRONMENTAL EDUCATION PROGRAM (PEEP)	E.T. Keech,Jr. & E. Williams	5-8	e-e		10
PROBLEM-ORIENTED PHYSICS INSTRUCTION	P. Signell	18+	p		10
PROBLEM SOLVING PROJECT	H. Sullivan	6-12	problem solving		6
PROCESS CURRICULUM INSTALLATION: INSTALLATION AND IMPLEMENTATION OF SCIENCE - A PROCESS APPROACH	J. Mahan	TEd	s		7
THE PROCESS MODULES FOR INVESTIGATING ENVIRONMENTAL PROBLEMS	H.R. Hungerford	10-14	e-e		10
PROGRAM FOR LOW ACHIEVERS IN MATHEMATICS (PLAM)	D. Frederick L. Begnaud	13-15	m		9,8
PROGRAM FOR MATHEMATICALLY UNDERDEVELOPED PUPILS	J.L. Foley	12-18	m		6
PROGRAM FOR PRE-COLLEGE CENTERS, CURRICULUM RESOURCES GROUP (CRG)	H. Branson	14-18	m,s		7,6,5
PROGRAMMED MATH TUTORIAL PROJECT (PMT) (See: Math Tutorial Project)	N.L. Ronshausen D.G. Ellson	5-7 TEd	m		9
PROJECT BIOTECH (See: AIBS Project Biotech)	R.A. Dodge	14+	b		8
PROJECT ENRICH - THE USE OF VOLUNTEERS IN TEACHING ECOLOGY	P.M. Metro	5-14 16-adult	e-e		10

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
PROJECT FOR THE MATHEMATICAL DEVELOPMENT OF CHILDREN	E.D. Nichols	5-8	m		9
PROJECT I-C-E (INSTRUCTION-CURRICULUM ENVIRONMENT) (I-C-E)	R.J. Warpinski	5-17 TEd adult	e-e		9,8
PROJECT IN-STEP (IN-SERVICE TEACHER EDUCATION PROGRAM)	J.C. Thurber	TEd	s		8,7
PROJECT LOCAL (LABORATORY PROGRAM FOR COMPUTER ASSISTED LEARNING) (See: Laboratory Program for Computer Assisted Learning (Project Local))	R.N. Haven	TEd	b,c,p,m, e-s,s-s, bus.ed.		7
PROJECT MER (MARINE ECOLOGY RESEARCH) (See: Marine Ecology Research Project)	D. Lundstrom & B. Watanabe	13-18	b,c,m-s		10
PROJECT PART-TIME PUPILS AS RESPONSIBLE TEACHERS TO INCREASE MUTUAL ESTEEM	M.F. Toomey	4-18	b,c,p,m, t,hu,e-s, i-a		9
PROJECT PHYSICS (See: Harvard Project Physics)	F.J. Rutherford	16-20 TEd	p,astr,hu		9,8
"PROJECT SUCCEED" SUCCESSFUL UTILIZATION OF CORRECTED CURRICULUM ERASES EDUCATIONAL DEFICIENCIES	H.G. Hollingsworth, Jr.	14-15	e-e,s-s,m		8
PROJECT USE (UPDATED SPACE EDUCATION)	J.C. Thurber	TEd	e-s,astr		8
PUNAHOU ENVIRONMENTAL EDUCATION/PROJECT	S. Ramler	5-18	e-e		8
QUANTITATIVE APPROACH TO ELEMENTARY SCHOOL SCIENCE (QS)	C.E. Swartz	6-12	s		8,7
QUANTITATIVE PHYSICAL SCIENCE (QPS) (See: Development of a Ninth Grade Course in Quantitative Physical Science and: Course Development Project in Quantitative Physical Science)	S. Githens,Jr.	14-18+	p-s		9,8,7

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
QUANTITATIVE TREATMENT IN THE DEVELOPMENT OF SCIENCE CONCEPTS (See: Use of Measurement in the Development of Science Concepts)	L.A. Neal	4-11 TEd	m,s, integ		2
RADIATION SCIENCE SEMINAR	J.W. Sulcoski	17-18	nuc-s		6
RADIOISOTOPES AND INQUIRY	J.L. Rips	15-18	b,p		6,5,4
REGIONAL ACADEMIC MARINE PROGRAM (RAMP)	S.J. Culterar	12-18	m-s,b		6
REGIONAL CENTER FOR PRE-COLLEGE MATHEMATICS CURRICULUM PROJECT	R.I. Hoffman	6-adult	m		10
REGIONAL STUDIES CENTER COLLEGE OF IDAHO	D. Parsons		e-e		8
REORGANIZED SCIENCE CURRICULUM, KINDERGARTEN THROUGH GRADE TWELVE, MINNEAPOLIS PUBLIC SCHOOLS	J.H. Shutts	5-18	s		5,3,2
THE RESEARCH AND DEVELOPMENT CENTER FOR TEACHER EDUCATION	G.E. Hall	TEd	ed		8
RIO PIEDRAS CURRICULUM CENTER - PRODUCTION OF SCIENCE MATERIALS		6-12	b,c,p, geol	Spanish	4
SAN ANTONIO LANGUAGE RESEARCH PROJECT FOR DISADVANTAGED SPANISH-SPEAKING CHILDREN	T.D. Horn	5-8	ESL-Eng	Spanish	6,5
SCHOOL COMMUNITY ENVIRONMENTAL STUDIES PROJECT (ESP)	W. Hon	16-18	e-e,s-s, lang,arts		8
SCHOOL HEALTH EDUCATION STUDY (SHES)	E.M.Sliepcevich	5-18	h		8,7
SCHOOL MATHEMATICS CURRICULUM IMPROVEMENT STUDY	H.F. Fehr	12-18	m		5
SCHOOL MATHEMATICS STUDY GROUP (SMSG)	E.G. Begle	5-18 TEd	m	Arabic, Bengali, Chin,Cypriot, Dutch,Fr,Gr, Indonesian, It, Jap, Korean, Portuguese, Swedish, Turkish, Vietnamese	9,8,7, 6,5,4, 3,2,1

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
SCHOOL SCIENCE CURRICULUM PROJECT	R. Salinger	5-14	s		8,7,6,5, 4,3,2
SCIENCE -- A PROCESS APPROACH (S-APA) (See: AAAS Commission on Science Education)	A.H. Livermore J.R. Mayor	5-12	b,c,p,m, e-s	German, Spanish	9,8,7
SCIENCE CENTER OF RESEARCH AND EVALUATION (SCORE)	P.S. Duffey	6-13	s		6
SCIENCE CENTER PROJECT	N.R. Croley		s		6
SCIENCE CONCEPT DEVELOPMENT IN THE ELEMENTARY SCHOOL THROUGH INQUIRY TRAINING	J.R. Suchman	6-14	s,p,ec, phys		3,2,1
SCIENCE COURSES FOR BACCALAUREATE EDUCATION	V.L. Persegian	18+	b,c,p, e-s,s-s		9,8,7,6, 5,4,3, 2,1
SCIENCE CURRICULUM IMPROVEMENT STUDY (SCIS)	R. Karplus	5-12	b,c,p, e-s	Jap.Swed, Fr,Gr,Sp, Danish	9,8,7,6, 5,4,3, 2,1
SCIENCE CURRICULUM PROGRAM: IMPLEMENTATION OF SCIENCE -- A PROCESS APPROACH	R.W. Ford	6-12	s		6
SCIENCE FOR GEORGIS SCHOOLS - JUNIOR HIGH SCHOOL		12-14	b,e-s, p-s		6
SCIENCE FOR NON-SCIENCE MAJORS (See: Science, Nature and the Survival of Man)	W. Bolles I.T. Edgar	16-19	e-e, integ		7
SCIENCE FOR THE SEVENTIES (SFTS)	I.T. Edgar	4-12	el-s	Korean	9,8,7
SCIENCE FOR THE SEVENTIES AND INSTRUCTIONAL TELEVISION (SFTS-ITV)	P.W. Welliver	5-12	el-s		10,9
SCIENCE GRADES 7-9	Y.A. Taylor	12-14	e-s,g-s		1
SCIENCE INSTRUCTION IN THE ELEMENTARY SCHOOLS OF MASSACHUSETTS	D.K. Whitla	5-12	s		8
SCIENCE K-6	S. Schenberg	5-12	s		1
SCIENCE MANPOWER PROJECT	F.Fitzpatrick	5-18	b,c,p,s		4,3,2,1
SCIENCE, NATURE AND THE SURVIVAL OF MAN (SNSM) (See: Science for Non-Science Majors)	W. H. Bolles I. T. Edgar	16-19	e-e		9,8

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
SCIENCE ON A SHOESTRING (See: Student Centered Science Program)	H. Strongin	5-13	b,c,p,m,	Spanish	New Title (1976)
SCIENCE TEACHING MATERIALS FOR ELEMENTARY AND JUNIOR HIGH SCHOOLS	R.J. Mayor	5-14	s		1
SECOND COURSE IN ALGEBRA AND TRIGONOMETRY WITH COMPUTER PROGRAMMING (See: Algebra With Computer Programming)	C.C. Feng	16-18	m,c-s		8
SECONDARY SCHOOL ENVIRONMENTAL EDUCATION PROJECT (SSEEP)	J.L. Aldrich	12+	w-r-m		9
SECONDARY SCHOOL MATHEMATICS CURRICULUM IMPROVEMENT STUDY (SSMCIS)	H.F. Fehr	11-18 TEd	m	Fr,Jap, Hebrew	9,8,7, 6,5,4
SECONDARY SCHOOL SCIENCE PROJECT (SSSP) (See: Time, Space & Matter and: Junior High School Science Project)	G. J. Pallrand F. L. Ferris	12-15	p-s,geol		8,7,6, 5,4,3
SELF PACED TUTORIAL COURSES FOR MINERAL SCIENCE - METALLURGY DEPARTMENTS	L.G. Twidwell	18+	en-t		10
SOCIAL SCIENCE EDUCATION CONSORTIUM (SSEC)	I. Morrissett	TEd	s-s		9
SOCIAL STUDIES CURRICULUM PROGRAM, EDC	P.B. Dow L. Fuchs	6-18	s-s		7,6,5
SOCIETY FOR ENVIRONMENTAL STABILIZATION	R.C. Nelson	5-12	e-e		8
SOCIOLOGICAL RESOURCES FOR THE SOCIAL STUDIES (SRSS)	R.C. Angell	16-19	s-s		9,8,7, 6,5,4
SOUTH CENTRAL KANSAS ELEMENTARY MATH-SCIENCE PROJECT (SOCK-EMS)	J.M. Nickel	5-12	b,c,p,m, e-s		9
SOUTHEASTERN PENNSYLVANIA OUTDOOR EDUCATION CENTER	L.B. Stratton	5-adult	e-e		7
SOUTHERN ILLINOIS UNIVERSITY-COMPREHENSIVE SCHOOL MATHEMATICS PROJECT (SIU-CSMP) (See: Comprehensive School Mathematics Program)	B. Kaufman	6-18	m		5

* Language translations

Project Title (Acronym)	Director/ Initiator	Age	Sugject	Language*	ICH Reports
SOUTHERN MINNESOTA SCHOOL COMPUTER PROJECT (SMSCP)	J. Odom	5-18	b,c,p,m, s,c-s		8
SPACE RESOURCES FOR TEACHERS (See: NASA Space Related Curriculum Supplements)	F. Tuttle	TEd	s,m,e-s, astr		7
SPATIAL ANALYSIS OF LAND USE PROJECT	J.F. Lounsbury	18+	g		10
SPECIAL ISSUE ON PLANT PATHOLOGY FOR THE AMERICAN BIOLOGY TEACHER (PlPathABT)	C.W. Boothroyd	18-20	b,agr-e		9
SPECIAL MATERIALS SCIENCE PROJECT (SMSP)	J.J. Rizza	12-13	g-s		7,6,5
THE STAC APPROACH TO CURRICULUM PLANNING USING KEYSORT CARDS (See: Teacher's Automated Guide)	D.W. Stoler J. Hutchinson	5-14	s		3,2
STANFORD-BRENTWOOD COMPUTER ASSISTED INSTRUCTION	P. Suppes	6	m		6,5
STATE OF MAINE (SCIENCE FOR ELEMENTARY SCHOOL TEACHERS PROGRAM)	P.A. Annas	TEd	s		1
STRUCTURING MATHEMATICS FOR INDIVIDUALIZED LEARNING EXPERIENCES (SMILE)	R.L. Hills	5-11	m		10
STUDENT ASSISTED DEVELOPMENT OF MATERIALS (SADMESS) (See: Environmental Education Curriculum Development Project)	I. Morrissett S. W. Helburn	12-18	e,h,s-s, art,phil		9
STUDENT CENTERED SCIENCE PROGRAM (See: Science On A Shoestring)	H. Strongin	5-13 TEd	b,c,p,m, e-s,s-s	Spanish	9
STUDENT CONCERNED ABOUT TOMORROW'S ENVIRONMENT (SCATE)	D. Toomsen	13-18	e-e,s-s		10
STUDENTS INSTRUCTIONAL GAMING NETWORK (SIGN) (See: WFF- n-Proof)	L. E. Allen	10-17	m,s-s, eng.		9
STUDY OF A QUANTITATIVE APPROACH IN ELEMENTARY SCHOOL SCIENCE	C. E. Swartz	6-12	s		6,5,4, 3,2
SUCCESS IN MATHEMATICS THROUGH AURAL READING TECHNIQUES (SMART)	F. Sganga	10-13	m		10,9

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
SURVEY OF RECENT EAST EUROPEAN LITERATURE IN SCHOOL AND COLLEGE MATHEMATICS	I. Wirszup A.L. Putnam	all TEd	m,p,t, psych, ed	Russian, French, East European Languages	9,7,6,5
SURVEY OF SCIENCE TEACHING IN THE ELEMENTARY SCHOOLS OF THE NATION (K-8)	P.E. Blackwood	5-14	pr-s		1
SURVIVAL: AN EXPERIENCE WITH THE NEW HUMANITIES	R. Todd	12-13	s-s,p-a		9
TAKE A LOOK! COMMUNITY ENVIRONMENTAL EVALUATION	H. Power	adult	e-e		8
TEACHER'S AUTOMATED GUIDE (TAG) (See: The STAC Approach to Curriculum Planning)	G. S. Ingebo	5-18	s		8,7,6, 5,4
TEACHER'S CENTER PROJECT	T. C. O'Brien	TEd	m		9
TEACHING ENVIRONMENTAL ISSUES	C. Smorodin	15-17	s-s,e-e		9
TEACHING FOURTH GRADE SCIENCE BY MEANS OF PROGRAMMED SCIENCE MATERIALS WITH LABORATORY EXPERIENCES	M.A. MacDougall	9	s		1
TEACHING MATERIALS THROUGH THE USE OF A TIME-SHARED COMPUTER (CAM)	J.O. Richardson	12, 14, 17	m		6,5,4
TECH PHYSICS PROJECT (PRODUCT: PHYSICS OF TECHNOLOGY MODULES) (See: National Tech Physics Project for the Production of Self Instructional Modules)	P. DiLavore	18-20	p		10,9
TECHNOLOGY FOR CHILDREN PROJECT (T4C)	F. J. Dreves	4-11	e-s,s-s, m,t,l-a		9,8,7
TIME,SPACE AND MATTER: INVESTIGATING THE PHYSICAL WORLD (TSM) (See: Secondary School Science Project And: Junior High School Science Project)	G.J. Pallrand	12-15	e-s		9
TOTAL EDUCATION IN THE TOTAL ENVIRONMENT (TETE)	W. R. Eblen	3-20 adult TEd	h-e		9,8,7
UNDER ROOF, DOME, AND SKY	J. Richardson	6-17 TEd	astr		9

*Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
UNIFIED SCIENCE AND MATHEMATICS FOR ELEMENTARY SCHOOLS (USMES)	E. L. Lomon	6-14	b,c,p,m, t,s-s, l-a		10,9,8
UNIFIED SCIENCE - A THREE YEAR APPROACH (See: Millburn Unified Science)	L. C. Blessing	15-18	s,integ		7
UNIVERSE AND I (U & I)	R. Shy	11-14	e-s		10
UNIVERSITY OF CALIFORNIA ELEMENTARY SCHOOL SCIENCE PROJECT	H.L. Mason	5-12	s		3,2
UNIVERSITY OF ILLINOIS ARITHMETIC PROJECT (See: The Arithmetic Project Course for Teachers)	D. A. Page	5-13	m		8,7,6,5 4,3,1
UNIVERSITY OF ILLINOIS ASTRONOMY PROGRAM (UIAP) (See: Elementary School Science Project And: University of Illinois Elementary School Science Project)	S. P. Wyatt J. M. Atkin	11-14	astr, p,e-s, m	Portuguese	9,8
UNIVERSITY OF ILLINOIS COMMITTEE ON SCHOOL MATHEMATICS (UICSM)	M. Beberman	12-18	m		7,6,5,4 3,2,1
UNIVERSITY OF ILLINOIS ELEMENTARY SCHOOL SCIENCE PROJECT (See: Elementary School Science Project And: University of Illinois Astronomy Program (UIAP))	J. M. Atkin S. P. Wyatt	10-13	astr		4,3,2,1
UNIVERSITY OF MARYLAND MATHEMATICS PROJECT (UMMaP)	J. Henkleman J. R. Mayor H. Walbesser	12-15 TEd	m		9,8,6,5, 4,3,2,1
UPPER MISSISSIPPI RIVER ECO-CENTER	D. Etnyre	10-12	b,m,e-e, e-s,s-s		10,9
USE OF COMPUTER-BASED TEACHING TECHNIQUES IN UNDERGRADUATE SCIENCE AND ENGINEERING EDUCATION	J.J. Allen	18+	b,c,p,s, c-s,s-s, en		8
USE OF MEASUREMENT IN THE DEVELOPMENT OF SCIENCE CONCEPTS	L. A. Neal	6-12 TEd	integ, m,s		3
VALUING THE ENVIRONMENT	C. T. Vizzini	6-11	e-e		9
VERMONT: ELEMENTARY SCIENCE PROJECT (See: Elementary Science Project)	B. Ragle	6-12	s		5

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
WASHINGTON: STUDY OF CHILDREN'S LEARNING OF PHYSICS PRINCIPLES (See: A Longitudinal Study of the Effectiveness of Children's Experimentation and Learning of Selected Physics Principles)	A. M. Lahti	6-12	p		5
WATERSHED HERITAGE PROJECT - A SECONDARY ENVIRONMENTAL EDUCATION PROGRAM (See: Cuyahoga Heritage Project)	J.H. Chadbourne	12-adult	e-e		10
WFF 'N PROOF: THE GAME OF MODERN LOGIC (See: Student's Instructional Gaming Network)	L. A. Allen	6-adult	m		1
WHAT PEOPLE EAT (See: What People Eat - Why People Eat)	I. Raw	17-19	nutr, b,c	Spanish, Portuguese	9
WHAT PEOPLE EAT - WHY PEOPLE EAT (See: What People Eat)	E. R. Pariser I. Raw J. Vournakis	17+	nutr, b,c	Spanish, Portuguese	10
WISCONSIN MATHEMATICS CURRICULUM PUBLICATIONS (See: Developing Mathematical Processes)	G.L. Henderson	6-18	m		7,6
WORTH CURRICULUM DEVELOPMENT CENTER AND SERVICES	B. Foley	6-14	s		8,7,6
WRITING AND TESTING A TEXTBOOK AND A TEACHER'S COMMENTARY FOR A TENTH-YEAR HIGH SCHOOL COURSE IN MODERN COORDINATE GEOMETRY (See: Modern Coordinate Geometry: A Wesleyan Experimental Curricular Study)	R.A. Rosenbloom	15	m		
YOU AND THE ENVIRONMENT: AN INVESTIGATIVE APPROACH (YATE) (See: Man and the Environment And: Life Science Investigations And: ERC Science Program)	G. Day D. Harvey	12-14	b,s-s, e-e		new title (1976)

* Language translations

Project Title (Acronym)	Director/ Initiator	Ages	Subject	Language*	ICH Reports
		UNESCO			
UNESCO-ACTIVITIES OF THE DIVISION OF SCIENCE TEACHING	A. V. Baez	adult	b,c,p, m	French, English	4
UNESCO MATHEMATICS AND SCIENCE EDUCATION ACTIVITIES	H. A. Foecke		b,c,p,m, s,integ-s	English & others	8,7
UNESCO'S PROGRAM IN INTEGRATED SCIENCE TEACHING	S. M. Haggis	6-14	integ-s	English & others	8,7

I. KEY TO THE INFORMATION ON THE PROJECT DESCRIPTIONS

OFFICIAL PROJECT TITLE AS FURNISHED
BY THE DIRECTOR (ACRONYM)

Address to use when writing for additional project information

Telephone: Telephone number for contacting project for more information

Director: Names of past or present project director, co-directors or contacts

Project Duration: Year project began and year it ended

Additional information, see also Clearinghouse Reports: (volume numbers) and the 20-Year Cumulative Directory for related or former titles, if applicable

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Age: of students involved
Ability: ability level
Subject: subject areas covered
Language: original language
Translations: other languages
Testing of Students: (includes)

- Written achievement tests
- Laboratory performance tests
- Oral tests
- Standardized tests
- Teacher judgments
- Student attitude questionnaire
- Interest inventories

Materials Developed by Project:

(includes)

Print

- Textbooks
- Lab Books
- Supplementary Books
- Programmed Units
- Activity Sheets
- Teacher Manuals
- Field Guides
- Evaluation Materials (tests)
- Behavioral Objectives
- Overview of Project
- Newsletters
- Charts

Non-Print

- Slides
- Filmstrips
- Filmloops
- Films
- Overhead Transparencies
- Videotape
- Slide Tape
- Audiotape
- Records
- Games
- Models
- Lab Equipment

Types of Learning Experiences:

(includes)

- Lecture
- Seminar
- Discussion
- Independent Study
- Laboratory Activities
- Field Experiences
- Demonstrations
- Simulations
- Audio/Visual

NARRATIVE: This section includes: director's responses to questions involving personnel, project history and development, objectives, and unique characteristics of the project; detailed list of materials produced including sources and costs; summary of teacher training materials and services, project evaluation, research and publicity; discussion of recent project activities and plans for the future.

ABBREVIATIONS USED IN PROJECT REPORTS

Subject:

Biology	bio
Chemistry	chem
Computer Science	computer sci
Educational Technology	ed tech
Engineering/Technology	eng/tech
Environmental Science	envir sci
Mathematics	math
Physics	phys
Social Science	soc sci

Testing of Students:

Laboratory performance tests	lab performance tests

Materials Developed by Project:

Print	
Evaluation Materials	Eval. Materials
Overview of Project	Overview
Teacher Manuals	Tchr. Manuals
Non-Print	
Overhead Transparencies	Overhead Trans.

Types of Learning Experiences:

Laboratory Activities	Lab. Activities

II. KEY FOR THE INDEX AND CUMULATIVE DIRECTORY ABBREVIATIONS

SUBJECT

agr-e	agricultural education
an	anthropology
art	art
astr	astronomy
b	biology
b-e	business education
b-s	behavioral sciences
c	chemistry
c-e	career education
c-s	computer science
com	communications
comp	computing
cyb	cybernetics
e-e	environmental education
e-p	environmental planning
e-s	earth-space
ec	economics
ecol	ecology
ed	education
ed-t	educational technology
el-s	elementary science
electric	electricity
electro	electronics
Eng	English
eng-s	engineering science
eng-t	engineering technology
f	forestry
g	geography
g-s	general science
geol	geology
h	health
h-e	home economics
h-s	history of science
hist	history
hu	humanities
i-a	industrial arts
integ	integrated
integ-s	integrated science
l-a	language arts
m	mathematics
m-s	marine science
mat	materials
med	medicine
meth	methods
mus	music
n-s	natural science
naut-s	nautical science
nuc-s	nuclear science
nutr	nutrition
p	physics
p-a	performing arts
p-e	physical education
p-s	physical science
phys	physiology
phil	philosophy
pr-s	primary science
psych	psychology
psych-ed	psychology education
r	religion
s	science
s-ed	science education
s-o	subject-oriented
s-s	social sciences
sur	survival
t	technology
u-s	urban studies
w-r-m	water resources management

ABILITY

avg	average
avg+	above average
all	all levels
EMR	educationally mentally retarded
EMH	educationally mentally handicapped
slow	slow learner
spec	special education
u-a	underachievers

AGES

TEd	teacher education